

Case Study Series

**WATER MANAGEMENT,
LIVESTOCK
AND THE OPIUM ECONOMY**

Livestock Husbandry



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



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Glossary

<i>ab</i> (colloquially <i>aw</i>)	water, river
<i>abdan</i>	water cistern or night storage reservoir
<i>ailaq</i>	summer camp for <i>kuchi</i>
<i>arbab</i>	village or community leader
<i>bazgar</i>	sharecropper
<i>chakka</i>	the surplus liquid after draining yoghurt through a cloth bag
<i>daima</i>	rainfed land (northwest Afghanistan)
<i>dasht</i>	semi-arid plain
<i>dehqan</i>	sharecropper
<i>Eid</i>	Islamic religious holiday
<i>Eid-i-Qurban</i>	the feast of the sacrifice
Farsiwan	person whose mother tongue is Farsi or Dari
<i>giraw</i>	mortgage
<i>ijara</i>	leasehold (usually last a number of years rather than one planting season)
<i>ijaradar</i>	tenant farmer
<i>jerib</i>	unit of land measurement; 5 <i>jerib</i> = 1 ha (2000 m ²)
<i>karez</i>	underground canal system that taps aquifers by gravity through a series of underground galleries or tunnels; often extends many kilometres before surfacing to provide water for drinking and irrigation; three types of <i>karez</i> : "long <i>karez</i> " (normally 1–4 km but can extend to 13 km; "short <i>karez</i> " (50–1000 m, generally in steep terrain); "tile <i>karez</i> " (<i>chow</i> or <i>jar</i>) found in or near washes
kilim	flatweave rug
<i>kishtamand</i>	cultivator, contract labourer (usually only for one planting season or at most one agricultural year; also commonly a tenant farmer (Herat)
<i>kuchi</i>	nomad
<i>lalmi</i>	rainfed land
<i>mahalla</i>	suburb, area of a city or village
<i>malik</i>	landlord, village or community leader (Pashtu)
<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>manteqa</i>	cluster of closely related villages
<i>mirab</i>	water master or bailiff; in some areas of Afghanistan (including Herat), assistant to <i>wakil</i> , equivalent to <i>chak bashi</i> or <i>kok bashi</i>
<i>mond</i>	measurement of weight, usually the same as a Kabuli <i>ser</i>
<i>morgh-i-nimagi</i>	chicken sharing (for brooding chicks)

<i>Naw Roz</i>	Persian New Year's Day celebrated on vernal equinox (21 March)
<i>qaimaq</i>	thick boiled cream, similar to clotted cream
<i>qala</i>	fort, fortified compound
<i>qawm</i>	extended family, tribe, clan
<i>qurut</i>	small balls of dried <i>chakka</i>
<i>ser</i>	4-7 kg of grain (location dependent)
<i>wakil</i>	water master or bailiff responsible for all of a primary canal (Herat); district representative (in cities)
<i>woliswal</i>	district governor
<i>woliswali</i>	district

Abbreviations and Acronyms

AMLAK	Afghanistan Mulkiyat ve Arazeh Kadaster (Land Registration and Cadastral Office, a department of MAAHF)
AREU	Afghanistan Research and Evaluation Unit
BRAC	Bangladesh Rural Advancement Committee
CDC	Community Development Council
DACAAR	Danish Committee for Aid to Afghan Refugees
DCA	Dutch Committee for Afghanistan
EC	European Commission
FAO	Food and Agriculture Organisation
GAA	German Agro Action
IDP	internally displaced person
INGO	international non-governmental organisation
MAAHF	Ministry of Agriculture Animal Husbandry & Food
MRRD	Ministry of Rural Reconstruction and Development
NSP	National Solidarity Programme
NGO	non-governmental organisation
RAMP	Rebuilding Agricultural Markets Programme (USAID)
UN	United Nations
UNAMA	United Nations Assistance Mission to Afghanistan
UNHCR	United Nations High Commission for Refugees
UNOPS	United Nations Office for Project Services
USAID	United States agency for International Development
VFU	Veterinary Field Unit

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1. Introduction

This study was undertaken as part of the initial stage 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 presents the findings from research into livestock husbandry which took place during November and December 2005 at primary research sites in four provinces (Nangarhar, Ghazni, Kunduz and Herat) and with one group of *kuchi* wintering in Laghman. It aims to make a contribution to gaps in knowledge, information and understanding of livestock husbandry, and to provide practical, well-informed guidance to government policymaking and donor-funded assistance. This report is a first step, and will set the scene for more detailed work to follow over the subsequent two years of the research project.

1.1 The context of livestock in Afghanistan

There are many indications that the Afghan population as a whole is not as dependent as it has been on cultivation of crops and livestock husbandry, and income earned from work in the cities or abroad is of increasing significance in the range of livelihood options that sustain rural families. Nonetheless, farming and livestock husbandry are said to account for 53 percent of a total GDP of approximately US\$4.6 billion¹ and by some estimates up to half of this may be derived from livestock production.² Most Afghan farmers are cultivating small and increasingly fragmented land holdings, while the landless are farming under varying systems of land tenure as tenants (*ijaradar*, *kishtamand*) and sharecroppers (*dehqan*, *bazgar*). Many are highly vulnerable to the vagaries of climate and food insecurity, as well as suffering from a lack of opportunities for education, medical care and non-farm employment in their own areas. For many rural Afghans, livestock represents a living asset that not only helps sustain rural households with protein, farm power and fibre, but which also provide additional income from the sale of animals and their products.

In Afghanistan, there are three systems within which livestock, both large and small ruminants, are managed (variations and combinations of these three basic systems can also be found):

- **Sedentary systems:** practised by farmers whose main activity is producing field and fruit crops (often a combination of both), who also raise some cattle, sheep and goats as well as poultry as an adjunct to these activities. Many villages also have access to nearby designated areas of common grazing or rangeland. Large and small ruminants are maintained on a balance of grazing, fodder and crop residues, supplemented when needed (and if possible) by a little grain.
- **Settled transhumance systems:** practised by farmers whose primary activity is raising livestock, but who also cultivate grain and fodder crops. These communities move their livestock between different seasonal settlements, winter and summer, together with some of the community.
- **Nomadic pastoral systems:** practised by mobile pastoralists or *kuchi* whose main livelihood and lifestyle is based on a tented life, raising livestock for the production of meat, milk products and wool, who move with their flocks and

¹ Excluding illicit opium trade.

² Ministry of Agriculture, Animal Husbandry and Food (MAAHF), 2005, *Master Plan*, Kabul: Government of Afghanistan.

herds as the seasons and grazing dictate, along well-defined lines of migration. *Kuchi* do not usually raise crops (although some groups do possess agricultural crop land), but usually depend on being able to purchase fodder and grain from the settled farming communities near which they camp in winter.

Livestock production in Afghanistan is generally a low-investment activity aimed primarily at meeting subsistence needs, with, if possible, a surplus to sell. It is supported as far as possible on what can be grown locally rather than on feed that is bought in. While the level of production is generally low, so is the level investment and expenditure.

Nomadic and transhumant flocks and herds have traditionally provided the main sources of meat, milk products and fibre for the urban consumer, although the settled rural population also make a valuable contribution. In most settled villages milk cows and poultry are kept primarily for household use. Sheep and goats are kept for domestic use and, if in surplus, they may provide income through the sale of animals, milk products and wool. In some communities carpet making and other related types of work are an integral part of rural livelihoods, although not necessarily associated with the actual ownership of sheep. In some periurban situations, milk cows and poultry may be kept for the purpose of supplying milk products, eggs and chickens to the urban population. Previously the meat needs of large urban centres such as Kabul were almost entirely met by domestic sources, but they are now increasingly dependent on imports from neighbouring countries such as Pakistan. Other livestock, particularly donkeys, but sometimes also horses and camels, play a vital role in lives of rural Afghans. Plough oxen still provide much of the draught power for cultivation and threshing, although they are increasingly being replaced by tractor power in many areas.

Exact numbers of livestock in Afghanistan are not known, but the official estimates of about 3.7 million cattle and 18 million sheep and goats are thought to be the lowest for many years. This represents a dramatic decline from the estimated 5 million cattle and 30 million sheep and goats prior to the drought that began in 1998–99.³ Over the past 30 years livestock numbers have fluctuated as a result of conflict – the Soviet war (1979–89) in particular – and drought (1998–2003). Recovery after the Soviet war was remarkably rapid, due in part to some years of good precipitation and grazing, as well as the return of nomads who had taken refuge with their flocks beyond the Afghan border. Although improvement in the quality of grazing areas since 2003 has helped flock increase in certain regions, particularly in northeast Afghanistan, in some areas flock recovery is proving to be slow as it has been hampered by disease. In some places the nomads are experiencing difficulty regaining access to their traditional summer grazing land in the mountains, or have lost traditional pasture land to cultivation.

Along with those diseases already common in Afghanistan, several new transboundary diseases are now also present, such as rinderpest, peste des petit ruminants (PPR), new serotypes of foot and mouth disease (FMD) and the potentially dangerous strains of bird flu (H5N1). The old state veterinary services are ineffective, under-resourced and locked in the attitudes and systems of the past. In 1988 a system of subsidised animal health delivery was established in much of eastern and southern

³ MAAHF, Master Plan. Also: U. Khan and M. Iqbal, 1998, *The Role and the Size of the Livestock Sector in Afghanistan* (draft), Islamabad: The World Bank quotes, "Total output of livestock declined at an average of 5.5 percent per year during the Afghan (Soviet) war 1978/79 – 1989/90. However livestock numbers had reached almost pre-war levels by 1995/96". Also: Food and Agriculture Organisation, 2003, *Afghanistan: National Livestock Census: Interim Report*, Kabul: FAO.

Afghanistan based on veterinary field units (VFUs).⁴ The role of the government regarding animal health is currently under review, as reflected in the recently drafted MAAHF *Master Plan*.⁵

1.2 Rationale and main issues addressed by the research

In Afghanistan considerable emphasis has always, and correctly, been paid to the problems of animal health, and there is already a considerable body of knowledge of animal diseases and methods of prevention and cure. An effective nationwide animal health programme has yet to be put into place, but how this might best be addressed has been studied and hotly debated. The range of programmes funded over the past 30 years have tended to reflect the philosophies and agendas of different donors, and the debate has centred around the relative emphasis that they believe should be placed on a free enterprise commercial private sector service with the government playing a regulatory and supporting role, as opposed to a government-led and subsidised veterinary service. The MAAHF *Master Plan* reflects the former approach.

Over the years much valuable work has helped to improve understanding of nomadic pastoralists in Afghanistan, but most of this work dates from the years prior to the Soviet War (1979–89) and needs to be updated in light of changed circumstances.⁶ More recent studies have tended to focus attention on particular cases of conflict between the nomadic and settled populations.⁷ While an understanding of these problems is important, emphasis on conflict has tended to obscure the subtleties of interdependency and symbiosis which are also important traditional features of nomad–settled relationships. Furthermore, internationally funded projects supporting livestock production over the past 30 years have concentrated attention on more easily accessible periurban milk and poultry production, rather than the truly rural (which is, after all, the majority of the rural population).⁸

Less attention has been paid to understanding the dynamics of livestock husbandry and production, and the place and relative importance of raising livestock in different farming systems, under different conditions, in different places. While not discounting the importance of animal health, this paper focuses on the more neglected issue of understanding how livestock is traditionally managed, the relationship of livestock production to existing farming systems, and how a better understanding of these issues can help to influence and refine government policy.

1.3 Data collection

In November and December 2005, the AREU research team travelled to five provinces: Ghazni, Kunduz, Herat, Nangarhar and Laghman. The team met with groups of farmers, community elders and livestock owners in sixteen villages, as well as with one group of nomads in their winter camp. Discussion was based around semi-

⁴ Initiated in 1988 by UNOPS, the VFU project was later taken over by FAO in 1993. Over the years, fluctuating funding has seen its effectiveness programme wax and wane. A modified model continues today, funded by USAID under the RAMP project and contracted through the Dutch Committee for Afghanistan.

⁵ MAAHF, *Master Plan*.

⁶ G. Pedersen and I. Nicolaisen, 1995, *Afghan Nomads in Transition: A Century of Change Among the Zala Khan Khel*, London: Thames and Hudson.

⁷ For example, L.A. Wiley, 2004, *Looking for Peace on the Pastures: Rural Land Relations in Afghanistan*, Kabul: Afghanistan Research and Evaluation Unit.

⁸ For example, the FAO-supported milk and fodder production and women's poultry production cooperative projects.

structured interviews designed to gain a better understanding of how livestock fits into settled farming systems, how it is managed in different circumstances and the significance of livestock husbandry to rural livelihoods. The following provinces, districts and villages were covered:

- **Five villages in Ghazni**, all in Khwaja Umari district. Two spring-line villages, Zala Qala and Pyada Rah, and three villages on the Ghazni River, Chel Gunbad, Turmai and Qala-i-Naw.
- **Three villages in Kunduz**. One rainfed village in Khanabad district, Alam Bai, and two riverine villages on the Kunduz River in Qala-i-Zal district, Afghan Mazar and Dana Haji.
- **Three villages in Herat**. One village in Kushk-i-Robat-i-Sangi district, Khalifa Rahmat-i-Ulya, and two villages in Pashtun Zarghun district, Tunyan Mian Deh (on the Hari Rod) and Ghorak (a spring-line village).
- **Five villages in Nangarhar**. Four villages in Achin district at different altitudes, Otarkhel, Khawaji, Sra Qala and Maruf China, and one in Batikot district, Janikhel.

Table 1. Primary research sites, GPS coordinates and elevations

Province	District	Settlement	Site coordinates from GPS readings (* indicates readings taken from maps)		Elevation (m)
Nangarhar	Achin	Khawaji	N 34° 01' 00"	E 70° 37' 37"	~1700
		Otarkhel	N 34° 03' 17"	E 70° 38' 46"	~1470
		Sra Qala	N 34° 07' 38"	E 70° 43' 00"	~950
		Maruf China	N 34° 11' 45.5"	E 70° 42' 24"	~690
	Batikot	Janikhel	N 34° 15' 22"	E 70° 44' 38"	~550
Ghazni	Khwaja Umari	Chel Gunbad	N 33° 43' 40.47"	E 68° 23' 18.49"	~2360
		Turmai	N 33° 41' 7.10"	E 68° 23' 56.0"	2300
		Qala-i-Naw	N 33° 38' 8.60"	E 68° 25' 12.50"	2255
		Zala Qala	N 33° 38' 49.3"	E 68° 18' 56.7"	2560
		Pyada Rah	N 33° 40' 26.2"	E 68° 20' 27.6"	2490
Kunduz	Qala-i-Zal	Dana Haji	N 36° 58' 24.50"	E 68° 31' 52.20"	335
		Afghan Mazar	N 36° 57' 41.80"	E 68° 34' 41.80"	340
		Wakil Jangal	N 36° 54' 52.70"	E 68° 34' 58.40"	345
	Khanabad	Alam Bai	unknown	unknown	~800
		Abdul Nazar	N 36° 34' 7.40"	E 69° 7' 29.00"	~800
Herat	Pashtun Zarghun	Gawashk	N 34° 17' 30.10"	E 62° 39' 41.50"	1090
		Tunyan	N 34° 18' 22.20"	E 62° 31' 5.90"	1030
		Gharak	N 34° 20' 23.70"	E 62° 36' 12.20"	1165
	Kushk	Khalifa Rahmat-i-Ulya	N 34° 46' 10.40"	E 62° 17' 30.10"	1305
		Sir Zar	N 34° 44' 45.30"	E 62° 18' 57.40"	1490

This selection of primary research sites provides regional contrast as well as comparisons within each province and district. Only in Achin district, Nangarhar, did security issues prevent the research team from meeting farmers and livestock owners in their villages. In the case of Achin, discussions were held with community elders who came to Jalalabad.

An initial study was also conducted with a group of nomads (*kuchi*), the Khomarikhel, in their winter camp in the Laghman valley. This group spends spring and autumn in the Shamali plains north of Kabul, and summer high in the Panjsher valley.

Researchers were assisted by two INGOs, the Danish Committee for Aid to Afghan Refugees (DACAAR) and German Agro Action (GAA), both of which are involved in ongoing rural and community development programmes in the primary research sites. In particular, DACAAR is an implementing partner of the National Solidarity Programme (NSP).

Informally gathered groups of villagers were met with in their own communities in a place of their choosing, usually the guest room of one of the leading community elders or a community meeting room. On two occasions meetings were held in the local "office" of the partner NGO. In the case of the four Achin villages where security was an issue, representative elders came to Jalalabad and were interviewed in the offices of GAA. In the case of the *kuchi* in Laghman a meeting was held in the open near their winter camp. These semi-structured discussions generally took 1.5–2.5 hours, and combined questions relating to land tenure with questions on farming systems, livestock husbandry and those of a more socioeconomic nature where relevant for general background information.

In addition the research team met with relevant officials in the provincial departments of the Ministry of Agriculture, Animal Husbandry and Food (MAAHF) in all four provinces.

2. MAAHF *Master Plan*

2.1 Background

The MAAHF⁹ *Master Plan* was approved in late 2005. Rather than representing actions in progress, it is more of a statement of intent and an identification of relevant issues. It is apparent that over the last 25 years, the government at all levels has suffered from reduced capacity to provide effective services to farmers and livestock owners. Initiatives such as those supported by the UN or international donors and implemented by NGOs have suffered from being short-term, under-funded and of primarily local impact.

The main problems currently affecting the livestock sector as identified in the Master Plan are summarised as follows:

- *The lack of a livestock policy and livestock development strategy;*
- *The lack of coordination between government, donors and NGOs' activities;*
- *The lack of adequately trained personnel in almost all areas of veterinary and animal husbandry services provision either to undertake public or private functions; and*
- *The weak organisation of the public services and inadequate distribution and motivating treatment of human resources.*¹⁰

Together these factors also seem to have adversely affected donors' long-term commitment to invest in the reconstruction of the livestock sector.

Visits to the provincial agricultural departments of Ghazni, Kunduz, Herat and Nangarhar and meetings held with officials responsible for the livestock sector confirmed the situation as summarised above. Lack of trained personnel, lack of funds to support even a modest service to farmers and the owners of livestock, along with poor pay and motivation, mean that at present the Afghan government is providing almost no meaningful support to the livestock sector. International funds are being used to support a piecemeal animal health service with NGO implementing partners, and a few NGOs are supporting initiatives concerned with livestock husbandry in a few villages in their command areas.¹¹ Although these projects are helping to fill a void, they have limited coverage and are negligible compared to actual need. As this study indicates, most livestock owners in Afghanistan are coping as well as they can with what is available from their own resources and knowledge.

2.2 Goal and objectives

The overall goal of the Afghan Government's plan for livestock production and husbandry is:

To increase livestock productivity and livestock production throughout Afghanistan to provide improved availability of animal proteins to the

⁹ In March 2006 the new ministry responsible for agriculture was proposed, and, when approved, will be known as the Ministry of Agriculture and Irrigation (superseding the MAAHF).

¹⁰ MAAHF, *Master Plan*, p. 32.

¹¹ For example, Relief International (working in Nangarhar) is supporting the development of small-scale broiler production and cooperative fish (carp) farms, mainly in Behsud district.

*people to people and increased revenues and well being of the livestock owners.*¹²

This is to be achieved through the protection of livestock against animal diseases and the improvement of livestock-raising practices, in accordance with the three pillars of the National Development Framework.¹³ The specific objectives are that, over the next few years, the majority of rural households practising animal husbandry will:

- *have improved significantly their livelihoods and level of income;*
- *have reached better security regarding health and nutrition of their animals to sustain food security and commercial productions generating farm capital; and*
- *contribute to the national economy through efficient pastoral and intensive quality productions for national and export markets.*¹⁴

It is clear that the objectives of the MAAHF *Master Plan* are complex and the magnitude of the problems facing Afghanistan is great. They will take time to address, and a flexible, small-scale project approach is recommended. In this way the government can experiment with a systematic, community-level, value-chain approach, rather than through isolated interventions. Major strategic interventions will need to be undertaken by the government over the next few years, including institutional reform and the establishment of effective coordination mechanisms between government departments and the private sector – which should be encouraged to engage more actively in the sector.

2.3 Animal husbandry: objectives, policies and strategies

The general objective of the MAAHF *Master Plan* on animal husbandry is:

To increase and secure livestock productivity and the national production of livestock products through the promotion and development of improved traditional and appropriate animal husbandry practices.

This is to be achieved through the implementation of extension services and development programmes in genetic improvement, nutrition and feed, and animal husbandry techniques. The development of human resources, at present badly lacking in qualified expertise, and the establishment of legislation and regulations are also necessary to support these aims in improving animal health and husbandry.

2.4 Constraints identified in the MAAHF *Master Plan*

The problems identified in the MAAHF *Master Plan* are divided into two categories: those relating to animal health, and those relating to animal husbandry. This paper concentrates on issues relating to livestock husbandry; reference is made to animal health issues where this is considered relevant to the context.

The constraints relating to livestock husbandry are summarised by the Ministry itself in the *Master Plan* as follows:

¹² MAAHF, *Master Plan*, p. 34.

¹³ 1) Humanitarian and human social capital; 2) Physical reconstruction and natural resources; 3) Private sector development. (Government of Afghanistan, 2002, *National Development Framework* [draft for consultation, v. 2], Kabul, http://www.af/resources/itsa/ig-april/ndf_revised_draft.pdf.)

¹⁴ MAAHF, *Master Plan*, p. 35.

- *Poor knowledge and monitoring regarding livestock numbers, productivity and production. The census undertaken in 2002 gives indications but its results are questionable.*
- *Poor standards of livestock management, including especially housing and nutrition.*
- *Weak feed resource base and periodic lack of pastures or feed linked to frequent droughts and insufficient availability of agriculture by-products which affects production and growth of national herds. This is aggravated by the undue occupation of a number of traditional pasture areas by powerful people (commanders).*
- *Lack of marketing facilities for live animals and animal products. Farmers have little information on marketing possibilities and opportunities, particularly for what concerns livestock by-products like hides and skins, wool etc.*
- *Lack of clear and adapted extension messages and of a coherent extension organisation. Even the Department services have little access to extension material. It is thus difficult for them to develop extension themes for the farmers.*
- *Inadequate information on, and access to, genetic material (grade reproducers, semen, embryo-transfer) for upgrading indigenous livestock. There is a need to upgrade local animal breeds but the Department is deprived of the needed equipment and materials.*
- *The insufficient and outdated legal frameworks for the control of livestock inputs and feeds, reproduction and genetics, livestock trade, processing of livestock products etc.*
- *Lack of any coherent legislation on land rights, conflict between nomads and sedentary farmers over land rights, severe conflict of interests between winter grazing rights and cultivation in many lowland regions.*
- *Inadequate financing of animal production investments. Existing financing tools are not anymore operational.*
- *Insufficient investment feed manufacturing.*
- *Lack of coordination between security institutions and the Department services, particularly along the borders.*
- *Weak water resources management.*
- *Traditional knowledge base eroded and outdated.*¹⁵

¹⁵ MAAHF, *Master Plan*, p. 33.

3. Findings from Ghazni

3.1 Khwaja Umari district

The village settlements of Khwaja Umari district included in this study fall into two categories:

1. Communities settled along Ghazni River and the irrigation channels taking water from it. For almost 30 km from the Band-i-Sultan dam (2,400 m.a.s.l.), downstream as far as Ghazni town (2,200 m.a.s.l.), fortified mud villages overlook irrigated orchards and fields of wheat, potatoes and forage. Fruit production is of primary importance. Livestock husbandry is mainly for subsistence until villages are close enough to Ghazni town to make the commercial production of milk and fattening sheep worthwhile.
2. A line of settlements 12–15 km west of Ghazni River across the open *dasht* along a spring-line that marks the foot of the surrounding mountains ranges at 2,500–2,600 m.a.s.l. These settlements depend on *karez* and springs to irrigate their crops. The environment is harsh, water resources limited, winters bitter and drought an ever-present threat. Extensive herding of small ruminants is of great importance, and conditions have led villagers to develop cropping systems based on the cultivation of drought-tolerant legumes and pulses.

In spring and autumn nomad (*kuchi*) herdsmen travel through the valley on their way to and from their winter camps in Kandahar and their summer pasturage in the higher mountains of the central Hindu Kush. The relationship between the nomads and the settled population, although mainly one of mutual tolerance, is sometimes one of conflict.

Spring-line villages: Zala Qala and Pyada Rah

Social and agricultural profile

Zala Qala and Pyada Rah share a similar ecological environment and practise similar cropping and livestock systems.

Zala Qala (2,560 m.a.s.l.) is the larger settlement with 70–100 households.¹⁶ Each household consists of two or three (or more) families.¹⁷ The population is all Sunni Pashtun, belonging to two main *qawm*: Durani and Ghilzai.

Pyada Rah (2,490 m.a.s.l.) is a small community of only 21 households, each comprised of two or three families. The population is Shia Hazara, and they are all closely related. They describe themselves as weak in relation to the more aggressive Pashtun *kuchi* and Wardaki herdsmen, who compete for the same grazing grounds.

Cropping systems

To understand livestock husbandry in Zala Qala and Pyada Rah it is necessary to describe the cropping system on which it depends, especially through the Ghazni winter. The crop lands of both villages consist of roughly terraced fields irrigated from *karez* and supplemented by what are termed “springs”.¹⁸ There are two *karez*

¹⁶ This depends on the method of calculating households. For this study’s purposes, researchers estimated about 100 households, while the villagers themselves estimated about 70 *qala* (compound).

¹⁷ It is common for the families of several married sons to occupy the same *qala* as the older generation.

¹⁸ These are short *karez* dug into the water-bearing strata to increase the flow of water.

in Zala Qala and four in Pyada Rah, of which only one is currently functioning. The drought that effectively lasted from the winter of 1998/99 to the winter of 2003/04¹⁹ seriously affected the flow of water in these *karez*. In Zala Qala several villagers banded together to dig deep wells and invested in water pumps. Despite this, the area of irrigated crop land has contracted, and with it the villagers' ability to cultivate crops – most significantly forage and fodder crops with which to maintain livestock through the winter months. Favourable weather conditions in 2005 meant that both agriculture and livestock production improved, but the situation has still not recovered to what it was before the drought and remains vulnerable. In Zala Qala the villagers stated that in 2005 only three quarters of the potential irrigated land was cultivated. Land holdings, fragmented by inheritance, range from less than 1 *jerib* to a maximum of 4 *jerib* and are limited further by lack of water.²⁰ Each village has access to some rainfed crop land but *lalmi* farming is an opportunistic occupation here because of the climatic conditions in Ghazni and its highly variable rainfall. The land is farmed under a mixture of freehold and sharecropping or tenancy arrangements made between neighbours and close relatives. Remittances from family members working abroad provide a significant contribution to the livelihoods of most families.

The cropping system is based on limited production of wheat and barley and the cultivation of a variety of legume and pulse crops. There are also some small orchards of apples, apricots and Bokhara plums, although these were badly affected by the drought.²¹ Wheat and some annual Persian clover (*shaftal*, *Trifolium resupinatum*) are sown in late autumn in Agrab (23 October to 21 November). In Zala Qala very little wheat was sown last autumn as water was being saved for crops more directly related to supporting livestock. Clover and barley are sown in the early spring in the month of Hamal (21 March to 20 April) for a grain and straw crop. Both wheat and barley straw are the basis of the dry feed given to all livestock. Clover is cut three or possibly four times depending on water, the early cuts for green forage and the last cut usually left for seed crop, with the residue fed to stock.²² A second crop of barley may be sown in the month of Sonbola (23 August to 22 September) for cutting as green forage in late autumn. Lucerne (*reshka*, *Medicago sativa*) is often intercropped between the lines of fruit trees, which ensures its regular irrigation. With sufficient water, up to four cuts of lucerne can be expected, the early cuts for green forage and the later for hay. Lucerne is maintained for up to six or seven years. Several drought-tolerant legumes and pulse crops are also cultivated. A vetch-like pulse known as *shaftal* (*Vicia sp*) is sown in early spring and harvested as a pulse crop which is then ground and used as winter feed for livestock. The crop residue is used as dry feed. Common vetch is sown in summer with a late crop of barley for cutting as green forage in the autumn. Other pulses include *adas*, a small lentil, and *mushing*, a small field pea. A great deal of importance is placed on the cultivation of these crops which provide food for both humans as well as livestock, which maintain the fertility of the soil and which are comparatively drought tolerant. These crops are harvested in late Asad (23 July to 22 August) and early Sonbola (23 August to 22 September) and are all typical of high

¹⁹ The drought was at its worst between 1998/99 and 2001/02.

²⁰ As is normal in most of rural Afghanistan, areas of crop land are not calculated by the villagers in the official unit of *jerib* (half an acre or one fifth of a hectare) but in units of seed sown.

²¹ In Zala Qala the villagers stated that the establishment of an orchard is a high-cost, long-term investment and that the drought had demonstrated the risks involved in drought-prone locations.

²² In many parts of Afghanistan, part of the very early cut of Persian clover (as well as lucerne) is relished as a human food – boiled and eaten as a mush like spinach.

mountain agriculture in Afghanistan.²³ Some maize and a few potatoes are cultivated if there is sufficient water, as well as vegetables for household consumption.

Livestock husbandry and production

Large ruminants: cattle

Milk cow and calves: Ownership of a milk cow and its calves is confined to those households with access to sufficient irrigated crop land to support them through the winter. In Zala Qala very few families are reported to own a cow and in Pyada Rah only four households out of 21 own one. Before the drought, when more land was under cultivation, more families are reported to have owned cattle, but in the present circumstances few can afford to.

Daily and seasonal management, herding and feeding: There are too few cattle in either village to justify employing a community cowherd. Each household looks after its own animals, which are generally kept close to the family *qala* and are effectively stall fed for much of the year. In spring and early summer, as available, green forage is fed, cut daily from the small fields of clover or lucerne. Weeds gathered by women are also fed to the cattle, and as the year progresses maize thinnings and crop residues from the pulses (and in the autumn fresh green barley or vetches) are also used as feed. The cattle are also grazed along the verges of fields, paths and irrigation channels. If no fresh green forage is available, dry feed, chopped straw and hay is fed. The stock graze the stubble and crop residues after harvest which is deemed common property.

For at least four months of winter, between the Afghan months of Qaws and Hut (22 November to 20 March), cattle are housed within the *qala* and stall fed on a mixture of chopped straw, lucerne hay and crop residue. If available, milled barley or pulses mixed with damp straw may be fed,²⁴ however such supplementary feed is provided sparingly and only when deemed to be essential. Those who can afford it may also buy cottonseed cake in the bazaar in Ghazni.

Bulls and breeding: In Zala Qala, only one family is reported to keep a bull. In Pyada Rah there are reported to be three young bulls. If there is no bull, cows must be walked to a neighbouring village to be served. No fee is charged for the service as this is considered un-Islamic.

Heifers usually have their first calf in their third year, and thereafter calve at intervals of one year to eighteen months or even longer, depending on the condition of the animal and the availability of a bull.

Plough oxen: There are no plough oxen in Zala Qala at present. During the drought it became too expensive to maintain oxen for no more than three months of work per year. Although it costs 400–500 Afs an hour to hire a tractor from a neighbouring village, this is generally considered to be more cost effective. The same applies in Pyada Rah where there is only one pair of oxen left, although there were several pairs before the drought. If a tractor and static thresher is hired²⁵ a percentage of the grain threshed is the usual charge rather than cash.

²³ Grass pea, another typical high country legume/pulse commonly cultivated throughout the Hazarajat and Badakhshan, does not appear to feature in the cropping systems of either Zala Qala or Pyada Rah.

²⁴ As neither village has a flour mill, grain of all kinds must be taken for grinding to the river valley villages where there are mills.

²⁵ The introduction of the Pakistan-made static thresher operated from the power take-off of a tractor has revolutionised the laborious activity of threshing with oxen and donkeys. Not only is the time substantially reduced by the tractor/thresher combination, but the straw is chopped into the right size

Large ruminants: products

Milk products: Household needs are the main use of milk, but any surplus may be shared with relatives and neighbours. Milk is often boiled and drunk warm or mixed with tea for breakfast, as well as being processed into yoghurt and buttermilk or into *chakka* and ghee. Under the prevailing conditions lactations are rarely more than 9 months and often shorter depending on the condition of the cow and the quality of the feeding.

Sale of cattle: Heifer calves are retained as replacements. Bull calves may be raised as plough oxen or even to become breeding bulls, but they are often sold at one year old or more depending on the ability of the family to maintain it. Availability of winter feed is a determining factor.

Small ruminants: sheep and goats

Sheep are of greater importance than cattle as they are only partially dependent on the irrigated crop land, spending much of the year grazing the open country surrounding the village. A few goats are kept to lead the flock and make up about 20 percent of the total flock in both villages.

In Zala Qala it was reported that about 98 percent of households own 8–15 sheep. One respondent admitted to being the largest sheep owner in the village with 50 ewes. Before the drought in Zala Qala the total flock is said to have been 600–700 breeding animals, but this was reduced to 200 head. Over the last two seasons numbers have increased again to 400 head.

In Pyada Rah it was reported that most households own 5–15 sheep and goats, the most 35 head. Before the drought the total village flock in Pyada Rah is reported to have numbered about 400 head, which drought reduced to 50 head. Since 2003, numbers have increased to 150 breeding sheep and goats. In both communities natural flock regeneration has been supplemented by the purchase of young ewes from the bazaar in Ghazni – made possible by the earnings of men working either in Ghazni or further afield.

Daily and seasonal management, herding and feeding: Both Zala Qala and Pyada Rah employ community shepherds. In Zala Qala 400 sheep and goats are split into two flocks, each looked after by a shepherd. One shepherd can usually manage 200–300 animals in one flock, accompanied by one or two large shepherd dogs to guard against strangers and wolves.

Between the end of Hut and the end of Aqrab (20 March to 21 November), depending on the season, the flocks graze the open country and mountain slopes surrounding the village to which the community have traditional rights of pasturage. The common grazing has boundaries marked by known geographical features. In neither Zala Qala nor Pyada Rah is any seasonal differentiation made between one part of the range and another. The shepherds gather the animals together each morning and lead them out to graze for the day, and return to the village each evening. Every animal returns to its owner's *qala* and receives an evening feed of green forage or dry feed. After harvest the flock graze the stubble and crop residues. They may also graze on the fallen leaves in the orchards in the autumn.

for both feeding to stock and for mixing with mud for traditional sun-dried brick and mud plaster buildings.

The sheep are housed during the cold weather for about four months from the end of Aqrab (21 November) to the end of Hut or early in Hamal (20–21 March). During this time they are stall fed three times a day on chopped straw, lucerne hay and crop residues. Ewes in late pregnancy may be fed a little milled barley or pulses mixed with damp straw, depending on the circumstances of the owners. In both Zala Qala and Pyada Rah there is a shortage of home-grown straw, and those who can afford the transport may go to Nawur district at harvest time to buy what is called *kah-i-safid* (white straw).²⁶ Straw, hay and crop residues are stored in mud-brick barns close to the family *qala*. Weeds, maize thinnings and dry stover, fallen leaves from the fruit and other trees are all fed – nothing is wasted. Even wild plants, coarse and spiny, are gathered dry in late summer and autumn from the surrounding mountains to feed both cattle and sheep in the winter.

Integrity of the pastures: In Zala Qala no conflict was reported with either neighbouring communities or *kuchi*. Groups of *kuchi* have the right of passage through Zala Qala territory on their seasonal migrations to and from their winter and summer quarters, and this right seems to be well respected by both sides. Potential conflict is usually sorted out by discussion and negotiation. In Pyada Rah the situation is very different. A group of Pashtun *kuchi* of the Niazi *qawm* who winter in Kandahar claim rights to graze their sheep in spring and summer on the same range claimed by Pyada Rah. They say that this right was given to them by a previous governor of Ghazni during the reign of Zahir Shah, and that they have documentation to prove this. These *kuchi* are reported to own several thousand head of sheep.²⁷ In addition flocks from across the provincial border owned by herdsmen from Wardak regularly poach the Pyada Rah grazing land in the summer. The villagers say they are too weak to resist these incursions without government assistance, and appear to be afraid to make any official complaint.

Rams and breeding: Only those who own more than one or two ewes keep a ram for breeding. In both Zala Qala and Pyada Rah great care is taken in selecting rams for breeding, taking account of conformation, shape and size of fat tail and wool colour. For most of the year the rams are kept at home and separated from the ewes. They join the ewes in the Afghan month of Mizan (23 September to 22 October) and stay together until the end of Aqrab (21 November).

Most lambs are born from late Dalw through the month of Hut (mid February to 20 March) while the sheep are still housed. Lambs remain with their mothers until the weather is good enough for the ewes to go out to graze. From that time the lambs are only with their mothers when they return in the evening. As the weather improves a shepherd lad is hired to take the lambs out to graze close to the village. Lambs are weaned in their third month, although the women often start to milk the ewes earlier than this.

Small ruminants: products

Milk products: The ewes (and goats) are milked for 2–3 months by the women, when the flock returns in the evening. A variety of products are made, including yoghurt, buttermilk, butterfat, ghee, *chakka* and *qurut*. Only those families with more than one or two animals are likely to sell any surplus ghee and *qurut* in the bazaar in Ghazni.

²⁶ The Dasht-i-Nawur in Ghazni province (at a higher elevation than Khwaja Umari), is an area where rainfed wheat and barley is cultivated. Rainfed straw is considered to be better quality fodder than the straw of irrigated wheat.

²⁷ They claim 5,000 head, but this should be taken as meaning “very many”.

Sale of animals: Ram lambs not required for breeding are generally castrated. If lambs are sold at 7–9 months, castration may not be considered necessary and many cannot afford to maintain them that long. Provided there is sufficient feed to maintain the animals through the winter the general preference is to sell wethers (castrated rams) at 18–20 months old, before their second winter. An animal of that age, in good condition, is expected to weigh 4–5 *mond* (28–35 kg live weight). All animals are sold by visual assessment rather than on actual weight. Late autumn or early winter is the preferred time to sell. Individual animals may be kept for the Eid sacrifice or Naw Roz (New Year to 21 March) feasts and a few keep an animal until they are 2–2.5 years old if they can afford to maintain it that long. At 2 years old a wether in good condition can weigh 9–10 *mond* (63–70 kg) live weight. Itinerant traders sometimes visit the villages to buy animals which they walk to Ghazni, but generally villagers prefer to take their sheep to sell in Ghazni themselves. Households that can afford to may slaughter a sheep (or two) in late autumn and dry the meat for winter.

Wool, goat hair and weaving: In Khwaja Umari it is customary to shear sheep twice a year, first in the spring and a second time in the autumn when they come in for the winter. The autumn wool is considered to be cleaner and fetches a better price. In Zala Qala (a Pashtun village) there is no strong tradition of weaving carpets although wool is used for knitting garments and for other domestic uses. Those with surplus wool sell it in Ghazni and have a keen understanding of the market and prices. In Pyada Rah (a Hazara village), on the other hand, there seems to be a strong tradition of making carpets, kilims and other wool handicrafts. Two diametrically different answers were obtained from the men and the women about weaving and handicraft production. According to the men the drought and loss of animals led the women to forget their skills: “They have even forgotten how to sew up bags of straw!” The response of the women was an indignant contradiction: according to them, in addition to all their other domestic chores and responsibilities (which include helping with the agricultural field work), they also have additional responsibilities which includes washing, spinning and carding wool as well as weaving kilims and saddle bags, making felts and embroidery work. Much of this work is carried out during the winter months.

Ghazni River villages: Chel Gunbad, Turmai and Qala-i-Naw

Social and agricultural profile

Situated on the banks of the Ghazni River from which they draw their irrigation water, Chel Gunbad, Turmai and Qala-i-Naw share some significant features of cropping and farming systems. Although comparatively few men from Chel Gunbad and Turmai are reported to be working abroad in Iran, Pakistan or elsewhere, many are working in Ghazni town. In Qala-i-Naw, on the other hand, most households are reported have family members working abroad, in Pakistan, Iran and elsewhere. and admit to a considerable reliance on foreign remittances.

Chel Gunbad (2,360 m.a.s.l.), the uppermost of the three villages, is situated about 2 km downstream of the Band-i-Sultan dam. The village stands on a high terrace above the left bank of the Ghazni River overlooking most of its agricultural land irrigated from a traditional channel. Some additional land above the village is irrigated from a *karez*. Beyond the cultivation lies open country which provides the community with some common grazing and occasional opportunistic rainfed farming. The population of 42 households is all Shia Hazara.

Turmai (2,300 m.a.s.l.) is about 10 km downstream of Chel Gunbad. The village stands on a bluff above the right bank of the river overlooking its agricultural land which is irrigated from one long canal shared with three other villages and another shorter canal. In recent years, a number of wells have been improved or dug in the river bed to supplement the water from the canals. There is effectively no range grazing. The population of about 129 households is all Shia Hazara.

Qala-i-Naw (2,255 m.a.s.l.) is a large village 7 km downstream of Turmai and about 12.5 km upstream of Ghazni town. The village is set on the left bank of the river in the midst of its agricultural land, which is irrigated from three traditional canals and a number of shallow wells dug in the river bed by individual land owners. There is effectively no range grazing. It has a large population of more than 350 households of mixed ethnic origin, including Pashtun, Tajik and Hazara. There are eleven Sunni and two Shia mosques.

Cropping systems

As with all the other villages with land irrigated from the Ghazni River, fruit orchards of apples, apricots and Bokhara plums dominate the rural economy in this area. Orchards occupy 70–80 percent of the irrigated land.²⁸ Wheat is cultivated to some extent, but it is only sufficient to provide households with two or three months' grain. Potatoes are planted for subsistence and sale if in surplus, as well as a variety of (mainly root) vegetables. Livestock husbandry is closely integrated with, and dependent on, the cropping system. While straw, maize stover and other crop residues make up much of the feed given to livestock in the winter, other fodder crops fit well into a healthy crop rotation. Perennial lucerne is intercropped with fruit trees, usually remaining for five or six years or until the canopy shades it out. In this way the lucerne is ensured regular irrigation while benefiting the fruit trees by fixing nitrogen. Lucerne is cut four to five times per season, the first cuts for green forage the later cuts for hay. Annual Persian clover is normally cut three times as green forage, with a fourth cut left for seed and the residue fed to stock. Other pulses and legumes such as those in the spring-line villages may be cultivated, but not to the same extent. Barley is sown in the early spring for a grain and straw crop, as well as a second sowing in late summer for green forage cut in late autumn. If there is sufficient water and land, some farmers cultivate a summer crop of short-maturing maize (90–100 days). The green thinnings and the dry stover are fed to stock. Although maize grain is eaten by people as a corn bread, some grain may be kept for feeding stock. Nothing is wasted and all edible crop and vegetable residues, including weeds and fallen leaves in the autumn, are collected and feed to stock.²⁹

Livestock husbandry and production

Large ruminants: cattle

Milk cow and calves: Ownership of a milk cow depends on land ownership, or at least on long-term access to some land on which to cultivate sufficient feed to maintain a cow and her calves. Not every household owns a milk cow and only a few own more than one. While in Chel Gunbad about 25 percent and in Turmai about 30 percent own a cow, in Qala-i-Naw about 50 percent do. In Chel Gunbad and Turmai milk cows are kept purely to meet domestic demands for milk. In Qala-i-Naw, on the

²⁸ Apples are generally sold to traders while still on the tree. Some early apricots may be sold fresh, but most are dried. Bokhara plums are skinned and sundried.

²⁹ However, some fruit farmers prefer to gather the fallen leaves around the base of the trees and use them as mulch.

other hand, there is the additional possibility of connecting with an urban demand for milk in Ghazni town, which is just close enough to make this possible.

Daily and seasonal management, herding and feeding: In Chel Gunbad sheep, goats and cattle are herded together each day by a community herdsman during the open months of the year, but in Turmai and Qala-i-Naw each family looks after its own cattle. Cattle graze around the edges of the cultivated land, irrigation canals and pathways, and return to their owner's house at night. Lactating cows remain close to the house most of the time, fed on green forage, clover, lucerne, green barley as well as weeds, crop residues and fallen leaves. After the harvest both cattle and small ruminants are allowed to graze the stubble. For about four months of cold weather from Qaws to the end of Hut (22 November to 20 March) the cattle are stall fed on chopped wheat and barley straw mixed with lucerne hay or crop residues. Grain (milled barley and maize) may be fed to lactating cows and cottonseed cake may be purchased in Ghazni. In Qala-i-Naw, where some households keep cows to produce milk for sale in Ghazni, there is more financial incentive to provide supplementary feed to lactating cows.

Bulls and breeding: Not every village has a breeding bull as this is an expense few can afford and for which there is no financial gain. There is no bull in Turmai and cows must be taken to a neighbouring village to be served. In Qala-i-Naw villagers complain that although there are three bulls in the village, none of them is any good. In Chel Gunbad there is one bull at present, but this is not always the case. It is not customary for the owner of a bull to charge service fees, even to people from a neighbouring village, as this is not considered good Islamic practice.

The Department of Agriculture (DoA) in Ghazni claims that it manages a regular Artificial Insemination (AI) service, but if this is the case it does not penetrate far from Ghazni town, and no one in the Khwaja Umari villages visited seemed to be aware of it. In Qala-i-Naw it was reported that an INGO had maintained a veterinary clinic and a bull station nearby during the time of the Taliban, but this closed about four years ago. This may account for the number of black and white cross-bred cattle in the lower valley. Some older men remembered that before the Soviet war the government had managed an AI programme in the area, but they said that it had not worked very effectively. "We would take our cows four or five times to the clinic and still they were not in calf, and we wasted months of time!"

Heifers seldom calve before their third year. Although cows in good condition served on time may calve on a regular annual basis, most do not and an 18-month or more calving cycle is more common. Lactations are seldom more than 9 months and often considerably less than that. Where cows are better fed and where there is some commercial incentive as in Qala-i-Naw, the situation may be slightly better.

Plough oxen: In Qala-i-Naw it was reported that there have been no plough oxen for the last ten years. In Chel Gunbad there was reported to be only one pair of oxen. In Turmai it was reported that there are one or two pairs of oxen left to plough the awkward corners and terraces where it is difficult to fit a tractor. Most cultivation and threshing is now mechanised: even if it means having to pay 400–450 Af\$ an hour to hire a tractor, this is considered to be more cost effective than maintaining a pair of plough oxen for twelve months.

Large ruminants: products

Milk products: Some farmers in Qala-i-Naw³⁰ keep cows for the purpose of selling milk products (yoghurt, butter and *chakka*) to shopkeepers in the town. This is difficult for communities further away from Ghazni such as Chel Gunbad and Turmai where cows are kept to meet domestic needs – although a household with a surplus may share or exchange it with neighbours.

Sale of cattle: Heifer calves are raised as replacements, and bull calves if not retained as plough oxen or bulls for breeding, may be sold when needed to a butcher or slaughtered for household consumption. The cattle economy is based on a low-cost input, low-output basis, with the possible exception of the villages closer to Ghazni town such as Qala-i-Naw.

Small ruminants: sheep and goats

Chel Gunbad in the upper valley has more open grazing areas than the lower villages which have very little. In Chel Gunbad the total community flock is about 150 breeding animals, of which only 10 or 12 are goats (to lead) and the rest sheep. They employ a community shepherd for the 8 or 9 open months of the year. No more than half the village households own any sheep, mostly 10–12 per household. Only one person owns as many as 20 ewes. There were more sheep in Chel Gunbad before the drought reduced the village flock to 80 animals, from which the number has gradually increased to its present level. Sheep, goats and cattle are all herded together. In Turmai, although there are 100–120 sheep there is little access to common grazing areas and it is not deemed worthwhile hiring a shepherd. In Qala-i-Naw there are very few breeding sheep, but some families specialise in buying young rams in spring to eventually sell in late autumn.

Daily and seasonal management, herding and feeding: Only in Chel Gunbad is any use made of common grazing land surrounding the village. In all these villages the animals spend much of the time grazing around the edges of the cultivated land. They come in every evening and are fed green forage, weeds and crop residues. After harvest the stubble and crop residues are grazed, as well as fallen leaves. In Qala-i-Naw those farmers who bought young rams or wethers in spring to fatten over summer sell these animals in late autumn in the bazaar in Ghazni. From the end of Aqrab until the beginning of Hamal the sheep and goats are housed and stall fed on a basic diet of chopped straw and chopped lucerne hay along with crop residues. While ewes in late pregnancy may be fed a little barley, maize or even cottonseed cake, this depends on the circumstances of individual households and the availability of grain.

Integrity of the pastures: Chel Gunbad has problems with Wardaki herders from across the provincial border poaching their grazing on the excuse of bringing their stock to drink at one or other of the springs lying on the Ghazni side of the watershed. These Wardakis have also established claims to some of the Chel Gunbad rainfed land. Neither Turmai nor Qala-i-Naw appears to make much use of grazing areas. In Qala-i-Naw there is a dispute over building development on land that is considered as common.

Groups of *kuchi* have the right of passage through the Khwaja Umari valley in spring and autumn and generally pass through without any conflict with the settled villagers. However, during the years of Taliban rule it was reported that they behaved

³⁰ Many farmers in the villages close to Ghazni keep milk cows to be able to sell milk products in Ghazni town, and cultivate lucerne in preference to other field crops as forage and fodder.

more arrogantly, grazing their flocks through the standing crops of the Hazara villages such as Chel Gunbad and Turmai.

Rams and breeding: In Chel Gunbad the rams run with the village flock all year. There appears to be no managed separation; although most lambs are reported to be born in late winter, some are born in autumn. In Turmai and Qala-i-Naw families with ewes take them to a neighbour who has a ram to be bred as there is no system of community flocking.

Small ruminant: products

Milk products: Lambs are weaned at about three months, but families who own sheep start to milk the ewes while the lambs are still suckling. A cloth is then tied over the udder to prevent the lamb (or kid) taking too much of its mother's milk. In Chel Gunbad, where a community flocking system exists, the lambs and kids remain at home when their mothers are taken out to graze. They are allowed to suckle in the evening and in the morning after the ewes have been milked. In all three villages sheep and goats are milked to meet domestic needs and the usual range of dairy products are made, including yoghurt, buttermilk, butterfat, ghee, *chakka*, *qaimaq* and *qurut*. Anyone who has a surplus may sell or exchange it with neighbours, but few have enough to make it worthwhile selling butter and *qurut* in Ghazni. Ewes are milked for two to three months.

Sale of animals: In Chel Gunbad a few families have surplus sheep to sell. Ram lambs not required for breeding are castrated when they are 6 months to 1 year old, when the weather is cool. The general preference is to sell wethers at 18 months to 2 years old, or even older. But this is only possible for those with sufficient feed to keep them through winter, and most families are compelled to sell their young rams at 7–9 months old in late autumn (before their first winter). In this case castration may not be necessary. Itinerant traders visit the villages from time to time to buy animals which they walk to Ghazni, otherwise several villagers may get together to take their sheep to Ghazni themselves. A wether in good condition at about 2 years old may weigh 55–60 kg live weight, and at 3 years old may weigh about 70 kg. These animals fetch the top prices.

In Turmai where most sheep and goats are kept as part of a household's subsistence economy there is no surplus to sell. In Qala-i-Naw there are only a few breeding sheep, but some families with sufficient forage and fodder specialise in buying young rams from the bazaar in Ghazni in early spring to grow on for sale in the coming autumn. A young ram in a lean condition at this age costs about 5,000 Afs. When sold fat at the end of autumn they can be sold for 8,000–9,000 Afs. Families who can afford to do so may fatten a ram for the Eid-i-Qurban sacrifice, or kill a sheep in autumn to dry the meat for the winter.

Wool and carpet weaving: In this area, sheep are shorn twice a year in spring and autumn. The autumn wool fetches the better price. However in all three villages most of the available wool is retained for domestic purposes rather than being sold. The village women wash, card and spin the wool, then knit garments such as gloves, socks and pullovers. They also make felt rugs and use the wool for stuffing mattresses. Previously in Chel Gunbad the women wove kilims and saddle bags but this practice seems to have ended some time ago. There seems to be no tradition of weaving in either Turmai or Qala-i-Naw.

4. Findings from Kunduz

4.1 Khanabad district

Khanabad district is east of Kunduz town and is crossed by the Khanabad River from the east, which joins the Kunduz River near the city. Most of the population live in settlements on the alluvial flood plain irrigated from the Khanabad river, and practise an intense agriculture based on double-cropping of wheat, clover, vegetables and other winter-sown crops followed in summer by crops of cotton, rice, maize and mung beans.

To the north and south of the irrigated land are dry rolling uplands of deep loess soil, where water for irrigation is virtually non-existent and the land is only suitable for rainfed farming and extensive seasonal livestock husbandry. Settled communities in this area are widely scattered and vulnerable to the vagaries of climate. In seasons of good precipitation it is possible to obtain a rainfed crop, but in years of drought, as occurred between 1998/99 and 2001/02, it is barely possible to obtain a crop of any kind. Access to drinking water is a perennial problem and these communities have devised a number of ingenious methods for harvesting water.³¹ Extensive herding of sheep and some goats used to be the mainstay of the rural economy, but drought led to drastic downsizing of flocks which have not yet recovered. While the drought broke in 2002/03 and good harvests were obtained in 2003 and 2005, it is taking longer to build up livestock numbers, and the occurrence of epidemic diseases such as FMD, enterotoxaemia and PPR are hindering the process of recovery.

Two closely related neighbouring settlements were selected as primary research sites, Abdul Nazar and Alam Bai, both set among the dry loess hills south of Khanabad bazaar, the main road and the river.

Alam Bai

Social and agricultural profile

Alam Bai (800 m.a.s.l.) belongs to a *manteqa* of three small, closely related settlements that consider themselves part of a single community (Mia Ali): Abdul Nazar, Alam Bai and Sufi Samad.³² The Mia Ali valley in which they are located cuts deep into the loess hills south of Khanabad bazaar and the settlements are located at about half-kilometre intervals 6–8 km from the edge of the irrigated cultivation of the Khanabad River flood plain (which provides the nearest source of clean drinking water). The inhabitants are Sunni Tajiks of the Karluq clan, descended from three brothers who settled here several generations ago. Alam Bai consists of 26 households with a total population of approximately 70, many of whom are currently working away from the village either in Kunduz or abroad. Issues relating to water and drought remain the major concern of the villagers. There is no reliable source of drinking water in the village and specially appointed families are responsible for going with their donkeys and water cans to collect drinking water from the nearest village irrigated from the Khanabad River. This operation takes at least five hours every day.

³¹ Rainwater is collected in underground cisterns (*abdan* or *kanda*); winter snow is collected and packed into crater-like pits dug into the ground known as "*yakdan*" or ice stores; for watering livestock, rain and flood water is channelled off the flood washes into ponds known locally as *wangara* – when these dry up the villagers have no option but to walk their stock each day to the nearest irrigation channel in the valley below them. In some places, wells called *jar* are dug in the bottom of the flood washes and joined by a shallow stone-lined tunnel similar to a *karez*.

³² The community is correctly known as Mia Ali but each settlement is designated by the name of the leading living personality in each community, as is often the case in rural Afghanistan.

Cropping systems

In the three Mia Ali villages there is no irrigation; only rainfed farming and some livestock husbandry is possible. The area is highly vulnerable to drought. Livestock, particularly sheep, used to be of more importance than now, but both rainfed agriculture and livestock suffered as the result of 1999–2003 drought. Although agriculture recovered in 2003 and 2005, livestock numbers have not. Lack of fodder forced farmers to sell livestock and crop failure forced people to migrate in search of work. The drought broke in 2003 and Afghanistan achieved its best wheat harvest in recorded history, and good rainfall in the winter and spring of 2004–05 led to another excellent rainfed crop.³³ Throughout most of the rainfed northeast, the main *lalmi* crop is wheat, sown both in autumn and spring depending on the timing of the rainfall.³⁴ Other rainfed crops are barley, flax/linseed (*zargheh*, *Linum usitatissimum*), sesame (*konjet*, *Sesamum indicum*), chick peas (*nakhod*, *Cicer arietinum*) and rainfed melons – both watermelons and sweet melons. Flax, sesame, chick peas and melons are all cultivated as cash crops, with some retained for household consumption. In productive years, such as 2003 and 2005, all these crops can be grown in surplus to the community's requirement and then sold. On the other hand, in years of drought there may be no yield at all – and this also applies to the straw and crop residues on which the community's livestock depend. Usually these crops are cultivated in a two- or three-year fallow rotation, but if one year of good rainfall follows another, wheat may be followed in an annual rotation by oil seeds, chick peas or melons. Rainfed agriculture is always risky and opportunistic as years of good precipitation tend to alternate with years of comparative drought. The soil in this area is deep-profile loess, which in favourable years can produce good rainfed crops, but in these villages much of the land is steep and can only be cultivated with difficulty by oxen. Locusts pose an almost annual threat to the rainfed crops, although they have been well controlled over the past four years under an FAO-supported programme.³⁵

Livestock husbandry and production

In Alam Bai ownership of livestock is dependent on a household's ability to cultivate rainfed crops. Without the straw and other crop residues these communities cannot maintain sheep or cattle through the winter. Neither can they maintain the plough oxen needed to cultivate their rainfed crops. The present situation in these villages reflects the consequences of the drought.

Large ruminants: cattle

Milk cow and calves: Out of 26 household in Alam Bai, fifteen own milk cows. These are grazed around the village during the day for the 8 or 9 open months of the year, returning to their owners' houses each evening where they are stall fed. Each family is responsible for looking after their own animals, as there are not enough cows to warrant employing a community herdsman. In years of good rainfall there is plenty of grass in spring and early summer on the hills beyond the cultivation, but the species are mostly ephemerals and the grazing burns off in summer. After the harvest, all animals are allowed to graze freely across the stubble. In drought years the grazing is depleted and few, if any, crops are cultivated. For about four months of

³³ In 2005 the threat of locusts was averted by timely intervention led by FAO assisting the MAAHF.

³⁴ Local wheat (some of which may be land races) such as Hazardana, Kalkoshe, Sorkhak and others have traditionally predominated, but in recent years some newly selected drought-tolerant lines have been introduced.

³⁵ Two main species of non-migratory locust threaten crops in northeast Afghanistan, *Bociostaucus maroccanus* and *Calliptamus italicus*.

cold weather, Qaws to Hut (22 November to 20 March), the cattle are housed and stall fed on chopped straw mixed with other crop residues and grass hay. If available, a little milled barley may also be fed to lactating cows.

Bulls and breeding: There is no bull in any of the three Mia Ali villages, so the cows must walk the 7–8 km to the villages near Khanabad bazaar where there are a few bulls to be served. No fee is charged by the owners of the bull for this service.

As in many other places heifers rarely have their first calf before their third year. Calving intervals are generally 1 year to eighteen months, but may be even longer when the animals are stressed or there is a problem finding a bull. Lactations seldom extend beyond 9 months and may be as short as six.

Plough oxen: There is still a demand for plough oxen in Alam Bai as much of the rainfed land is too steep for mechanised cultivation. There are reported to be six pairs of oxen in Alam Bai alone. Working oxen and donkeys may be fed a little grain if it is available. Bull calves kept for plough oxen are not usually castrated until their second year, but only households with sufficient resources can afford to maintain a pair of oxen. Some households may keep only one ox and share cultivation with others to make a pair.

Large ruminants: products

Milk is produced for household consumption, and surplus is shared with neighbours. Bull calves may be retained for plough oxen, and heifers as replacements.

Small ruminants: sheep and goats

Before the drought it was common for individual households to own 40–60 head of small stock. For instance, Alam Bai (a leading personality) had 50 head before the drought. At present there are reported to be no more than 30 breeding sheep in total, and one or two goats in Alam Bai. Few households own more than one or two animals. One person owns fifteen, two others five or six. Most families do not own any sheep at all. The most popular type of sheep raised here is known locally as "Arab", a long-legged type common in the Kunduz area and best known for its meat quality. Most are light brown in colour with a light fleece of poor quality.

Daily and seasonal management, herding and feeding: There are too few animals to warrant hiring a community shepherd, although before the drought there was one. It is proving difficult to build up the village flock again from such a low breeding base. At present each family is responsible for grazing their own animals on the open country and hill slopes around the village. After the harvest is gathered, the stubble grazing is free for all. As long as the weather is open the sheep continue to graze outside during the daytime (even during winter) and are only brought into the stables during spells of bad weather. However, they return to the village each evening to their owners' houses to be stall fed. No fodder or pulse crops are cultivated and all livestock are fed on chopped straw and crop residues. Wild hay is cut from the ungrazed banks and steeper slopes in late spring and early summer. Supplementary feed is seldom fed to sheep, and never to goats.

Rams and breeding: Only individuals with more than one or two sheep keep a ram for breeding, but no charge is made for servicing the ewes of those who do not have a ram. Most lambs are born in late winter during the month of Hut (20 February to 20 March).

Small ruminants: products

Milk products: Lambs are allowed to suckle for about three months. To prevent the lambs taking too much milk a cloth is tied over the ewe's udder. The women milk the ewes and make yoghurt, buttermilk, butter, *chakka* and *qurut*. Under current circumstances, there is no surplus milk to sell.

Sale for animals: Most farmers in Alam Bai sell surplus ram lambs at 6–9 months old in late autumn, as few families can afford to keep them longer. If the animals are sold at this age no castration is necessary. They prefer to sell as early as possible to avoid taking the risk of animals dying. If they are kept longer, rams not required for breeding are generally castrated at about 6–9 months before the winter if they are going to be sold at a later age. Better-off families may keep a sheep to fatten for the *Eid-i-Qurban* sacrifice, but few can afford to do so.

Wool and weaving: In this area sheep are shorn once a year in spring. At present there is little surplus wool to sell, although those that have more animals may do so. There does not appear to be an active commercial handicraft industry in Alam Bai. Nonetheless, wool is processed by the women for domestic purposes, spun and knitted into gloves, socks and pullovers.

4.2 Qala-i-Zal district

Qala-i-Zal district lies to the northwest of Kunduz town, astride the lower Kunduz River as far as its confluence with the Amu Darya (Oxus) River, which forms the frontier between Afghanistan and Tajikistan. Until the early 1900s the flood plain of the lower Kunduz River was malarial marsh and riverine scrub forest, inhabited by wild animals of all kinds including tigers. Starting in the early 1900s and continuing through the reigns of successive Afghan kings, the marshes were drained, irrigation channels dug and farming settlements encouraged.³⁶

Afghan Mazar and Dana Haji

Social and agricultural profile

Dana Haji is an older settlement than Afghan Mazar. Both are irrigated from parallel channels more than 20 km long, and both have economies that are based on irrigated cropping and carpet weaving. Being at the tail of the canal, Afghan Mazar has a serious problem with irrigation water for summer crops. Dana Haji is situated halfway down the equally long Aq Tapa canal, but has adequate irrigation water in summer and therefore fewer problems cultivating a summer crop.

Livestock husbandry is very dependent on irrigated crop production, and the settled villagers appear to have little access to grazing areas which is the winter preserve of the nomads. Opium addiction is a serious social problem said to be related to carpet weaving.³⁷

³⁶ Many Pashtuns from southern and eastern Afghanistan were settled in Kunduz, as well as Uzbeks and Turkmans – many of whom had fled from Russian and Soviet rule north of the river.

³⁷ There has been a long tradition of cultivating some poppy for home consumption, and opium addiction is a serious problem in this and other Turkman communities among both men and women, but reportedly it is more serious among the women. They blame the habit on the fact that women are busy weaving carpets and that they give their children opium to keep them quiet – in this way developing an addiction.

Cropping systems

Irrigated agriculture is based on a double-cropping system of winter-sown wheat, barley and clover, and summer crops of cotton, maize and mung bean, flax, sesame and melons. Root vegetables such as carrots, turnips, white radish and onions are also cultivated. Some lucerne is cultivated for fodder. A little opium poppy is cultivated, but this is primarily to satisfy a local demand. Although double-cropping is possible in most places, some settlements such as Afghan Mazar have a problem obtaining sufficient water for a summer crop. There are also problems with poor drainage and increasing salinity. Livestock husbandry is of secondary importance to agriculture, and, as far as it exists, it is mainly subsistence in character.³⁸

The strip of irrigated riverine settlement is flanked by wide plains known as the Dasht-i-Abdan, which provide winter and spring pasturage for Persian-speaking "Arabs" and Pashto-speaking "*Kandari*" nomads who summer in the Badakhshan highlands. These *kuchi* may buy grain and fodder for their flocks from the Turkmans in the winter. There does not appear to be serious conflict between the settled villagers and the nomads, although there are instances where Pashtun *kuchi* claim title to land developed for agriculture by the Turkmans.³⁹

Livestock husbandry and production

Large ruminants: cattle

Milk cow and calves: In Afghan Mazar, around half of the households keep a milk cow for household needs, although none has more than one or two plus offspring. In contrast, in Dana Haji only four or five out of about 40 households possess a milk cow. This is notable because in Dana Haji there should be more fodder and forage. The general management regime and feed base is similar in both communities. The cattle are individually herded by their owners and grazed close to the village along the verges of crop land, roads and canals. They return to their owners' houses at night. There is no system of community herding. As the winter climate is comparatively mild, cattle graze out all the year during the day unless the weather is bad. Between Qaws and Hut (22 November to 20 March) they may be housed during periods of inclement weather. During spring, summer and autumn months the cattle are fed green forage of all kinds including weeds, clover, lucerne and maize thinnings. When this is not available chopped straw, hay and crop residues are fed. Supplementary feed in the form of milled barley and maize may be fed to lactating cows if available. If the farmer can afford it, he may buy cottonseed cake in Kunduz from the Spinzar cotton gin press. As in many other parts of rural Afghanistan the cattle are small and productivity is low. A heifer usually calves for the first time in its third year; thereafter calving intervals vary between one year and eighteen months, or even longer.

Bulls and breeding: No bull is kept in either village, and those who own a cow must take it to a neighbouring village to be serviced (for which there is no charge).

³⁸ Traditionally Turkman (Turcoman) people have been (and in many places still are) notable owners of livestock of all kinds, including horses, camels, sheep and goats. Possibly because the Turkman settlers in Qala-i-Zal arrived in the 1920s as landless and stockless refugees from north of the Amu Darya, they have never returned to being stock owners of any note – although the tradition of weaving has been retained.

³⁹ This is the case in Surarak village where the original title was given to some *Kandari kuchi* in the 1920s, who then sold it (informally) to the Turkmans who developed the land for farming and have lived there since then. The *Kandari kuchi* now say that they want the land back.

Plough oxen: In Afghan Mazar plough oxen are still common; few people have tractors and around half the households in the village have at least one plough ox. Families with only one ox team up with a neighbour to make a pair for cultivation. When working, plough oxen may be given some supplementary feed in the form of barley, maize or cottonseed cake. In Dana Haji, on the other hand, there is only one pair of oxen left and most cultivation and threshing is now mechanised. Tractors for ploughing cost 700 Afs (US\$14.60), which seems expensive compared to other parts of Afghanistan. Nonetheless, the villagers consider hiring a tractor more cost effective than maintaining oxen, especially in a double-cropping system where there are advantages in cutting the time lag between harvesting the first crop and sowing the second.

Small ruminants: sheep and goats

In Afghan Mazar only 10 percent of households own sheep, and most no more than one or two each. Three families own more: 15, 30 and 40 animals respectively. In Dana Haji, about 15 or at most 20 households out of 40 are reported to own sheep. There do not appear to be any goats. However, one person in Dana Haji is reported to own about 100 sheep.

Management and feeding: As few families own more than one or two sheep, most are individually grazed by their owners around the edges of cultivated land, irrigation channels and road. The three families in who own more than two or three sheep on occasion band together and hire a shepherd to take the sheep out to graze on the *dasht* or on whatever waste land is available. After the harvest, sheep as well as cattle may graze across the stubble and crop residues, until the fields are ploughed. Green forage, including weeds, is fed in season, and during the cold weather chopped straw, hay and crop residues are used.

Rams and breeding: Only those with more sheep own a breeding ram, but service for those who do not is free of charge.

Small ruminants: products

Milk products: Sheep's milk is processed into yoghurt, butter, buttermilk and *chakka* for the household. Those with some surplus may sell or exchange it within the community. To prevent the lambs taking too much of their mother's milk a cloth is tied over the udder.

Sale of sheep: Sheep may be sold at any time of the year if a family has an animal to sell and needs the cash, but the preferred age for sale is 6–9 months and autumn is the preferred season. Families who can afford it will buy a sheep for the *Eid-i-Qurban* sacrifice.

Wool and weaving: Very little wool is produced locally; it is of poor quality and used only for household purposes or for weaving rough kilims and saddle bags. Nonetheless, carpet making is an important traditional cottage industry for the Turkmans of Qala-i-Zal. This is probably a legacy of previous times when they were herdsmen on the Central Asian steppe. Women of all ages are engaged in this industry – carpets are woven on contract to traders (also Turkman), many of whom are living and trading in Pakistan. The traders provide the families with credit for looms and equipment as well as wool, dye and designs. The wool and dye also comes from Pakistan, and the wool may even be imported from countries such as Australia and New Zealand.

5. Findings from Herat

5.1 Kushk-i-Robat-i-Sangi district

The district of Kushk-i-Robat-i-Sangi (“the Stone Caravanserai”) lies to the north of Herat city astride the main road to the Turgundi border crossing with Turkmenistan.⁴⁰ The road crosses the watershed north of Herat, after which the land slopes north to the frontier. The area is extremely drought-prone and the potential for productive irrigated farming is confined to the valley of the Kushk River and its tributary streams which drain into the deserts of Turkmenistan. The district is characterised by rolling open plains and low mountains suitable for seasonal grazing of sheep and goats and some opportunistic rainfed agriculture. Previously there were extensive stands of wild pistachio (*Pistachia vera*). Settlements are scattered widely along the Kushk river valley and its tributaries, and the villages of Khalifa Rahmat and Sir Zar, AREU’s primary research sites, are typical of the area. Similar cropping and livestock systems exist in these two villages, however only Khalifa Rahmat-i-Ulya was visited for this livestock component of the project.

Khalifa Rahmat-i-Ulya

Social and agricultural profile

Khalifa Rahmat lies around 15 km up a side valley running southeast into the hills from Kushk bazaar. There are two neighbouring villages about a kilometre apart: Khalifa Rahmat-i-Sufla (lower Khalifa Rahmat) and Khalifa Rahmat-i-Ulya (upper Khalifa Rahmat), connected by an irrigation channel.⁴¹ The villagers estimate the total number of households for both settlements at about 270, of which about 70 households are in Khalifa Rahmat-i-Ulya. Although the two settlements have a slightly different historical origin they appear to belong to a single *manteqa* and they share a *wakil*. The villagers in Khalifa Rahmat-i-Ulya describe themselves as Farsiwan (Persian speakers) of the Timuri tribe.⁴² There are indications that they were originally nomadic or semi-nomadic herdsmen who settled here within the last few generations; some vestiges of transhumance herding remain.

Two irrigation channels provide Khalifa Ulya with water: one from the left bank and the other from the right bank of the stream. The longer right bank channel also serves Khalifa Rahmat-i-Sufla. These perennial and seasonal streams provide some limited opportunity for irrigated farming. The surrounding hills and plains are suitable for rainfed farming (known in this area as *daima*) in years of good precipitation and extensive seasonal grazing for livestock (mainly sheep, goats and some cattle). Making carpets and kilims is an important traditional activity. This whole area was seriously affected by the drought of 1998/99 to 2002/03. Crop production was reduced, villagers were compelled to downsize their flocks, and many families were forced to migrate to find work in Herat and Iran or seek assistance in the IDP (internally displaced person) camps round Herat. Almost every household still has

⁴⁰ The road follows the ancient caravan route that once connected Herat with the oases markets of Central Asia. Robat-i-Sangi gets its name from the site of a caravanserai that once offered shelter and rest to traders and travellers.

⁴¹ The two villages take their names from a local saint whose tomb is on the top of a hill overlooking the valley, between the two villages. Khalifa (caliph) is a title often given to a Sufi saint by his devotees.

⁴² This is a name that harks back to the days when Herat was the capital of the Timurid empire in the fifteenth century. This tribal group spans the Afghan–Iranian frontier and is also found in Iran in Khorasan.

family members working in Herat or Iran and remittances are a significant contribution to livelihoods.

Cropping systems

Irrigated crop land is confined to terraced land below the village and some land at a higher elevation closer to the source of water. The drought led to a contraction of irrigated crop land which has not yet been fully recovered. Wheat, the main subsistence crop, is sown in the month of Dalw (21 January – 19 February). Some barley is cultivated, sown in early spring in Hamal and Sawr (21 March to 21 May), as well as Persian clover for green forage. Three cuts of clover are obtained, the last cut being left for seed and the residue fed to livestock. Some field pea is also cultivated. A second crop of barley is sown during Asad and Sonbola (22 July to 22 September), which is cut green for forage in the late autumn. Some perennial lucerne is cultivated by farmers who have sufficient water and it is usually managed for five or six years before ploughing in. Five cuts may be obtained, even six if there is sufficient water, with the first cuts fed as green forage and the later cuts made into hay for winter. Some vegetables, mainly root and tuber crops such as carrots, turnips, onions and potatoes, are cultivated in small plots close to the houses for household consumption. Farmers with only small land holdings do not cultivate much wheat, preferring to grow root crops and potatoes. Weeds gathered by the women from the fields in spring are fed to livestock together with crop residues. Some of these “weeds”, such as one known as *gandomak*, are also relished as green vegetables. Rainfed cropping is highly dependent on rainfall, which varies considerably from one season to the next. Between 1998–99 and 2001–02, almost no rainfed crops were possible because of drought. Since 2002, and particularly in 2003 and 2005, the situation has improved. The four main rainfed crops are wheat, barley, chick peas and white cumin (*karabia* or *zira-i-safid*, *Cuminum cyminum*). Some black cumin (*zira-i-siah*, *Bunium persicum*), a drought-resistant perennial, is also cultivated. Rainfed farming is based on a 2- to 3-year fallow rotation, and in years of good rainfall *daima* farmers in this part of Afghanistan can reasonably expect a return on seed sown of about 10:1. The greatest threat to the wheat crop is the annual plague of sunnpest,⁴³ and recent control programmes have been only partially effective.

Livestock husbandry and production

Large ruminants: cattle

Milk cow and calves: According to the villagers, more than half of the households in Khalifa Rahmat own at least one milk cow plus offspring. Although most possess only one cow, a few households have two and a few have three. As many as 25 households from the pair of villages own four or five cattle of all ages and sexes. There are enough cattle to warrant hiring a community herdsman for each of the communities. The cattle are herded during eight months of the year, between the beginning of Sawr and the end of Aqrab (21 April to 21 November). The herdsman collects the cattle in the early morning and takes them out to graze on the open land around the village. They return in the evening to their owners' houses where they are fed green forage if available or straw or crop residue if not. For 4–4.5 months between the beginning of Qaws to late Hamal (22 November to 20 April) the cattle are stall fed with chopped wheat or barley straw mixed (if available) with chopped lucerne hay or crop residues. Those who can afford to may feed some

⁴³ A stink bug that sucks the juices from the ripening grain, and spoils more than it eats. Three species of sunnpest are common in Afghanistan, especially in Herat, Badghis, Faryab and Helmand provinces, where they pose a serious threat to both rainfed and irrigated wheat crops (*Eurygaster integriceps*, *Dolycoris penicillaptus*, *Aelicaccum inata*).

milled barley or cottonseed cake bought in Herat to lactating cows or to animals in need of special care, including working oxen. This is done sparingly.

Bulls and breeding: There is only one bull between the two villages, owned by the *wakil*. The bull runs with the herd during the day and service is provided free. According to the villagers it is common for a heifer to have its first calf in its third year. If it is in good condition a cow may bear a calf each year but calving intervals are more commonly eighteen months or even two years.

Large ruminants: products

Milk products: Cows rarely lactate for more than 9 months and often as little as 6 months if feed is scarce and the cow in poor condition. Cows' milk is for domestic consumption although households with several cows and a surplus may sell *chakka* or *qurut*, although this is more commonly made from sheep's milk. Some of the first milk or colostrum after a calf is born is consumed by the family and often shared with neighbours.⁴⁴

Sale of cattle: Heifer calves are reared as replacements, and bull calves, if not required for breeding or as plough oxen, will be raised for slaughter or sale.

Plough oxen: Only three pairs of oxen are reported to remain between the two Khwaja Rahmat settlements, and it is now common to rent tractors for cultivation as well as for threshing. As there are no tractors in Khalifa Rahmat, these must be found in neighbouring villages or from Kushk bazaar.

Small ruminants: sheep and goats

30–35 percent of households in Khalifa Rahmat own a few sheep, mostly two or three; a few people, including the *wakil*, own more. The *wakil* owns 100–120 head and a few others possess 10, 20, 30, 40 and up to 50 head in approximate numbers. The villagers reckon that the total community flock amounts to about 1,100 head, of which about 80 percent are sheep and 20 percent are goats. Before the drought the community flock numbered 3,000–4,000 head, but the drought compelled them to sell stock.

Grazing, management, herding and feeding: There are three flocks of 300–400 head, each with its own shepherd. Assistants are hired as required to herd the lambs separately from their mothers. Three breeds of sheep are kept in these villages; the most sought-after are known locally as "Arab" and "kareh".⁴⁵ These are comparatively large and long-legged and are coloured golden brown, black or grey. They are prized for their size and meat quality rather than for their wool. The other two types are "gadi" and "goldan" which are smaller-framed, white wool sheep, and, like the better-known "Baluch", have black noses and black eyes, and produce better quality wool. All these breeds are fat tails. The sheep and goats are herded for around eight months of the year, from the beginning of Hamal to the end of Aqrab (21 March to 21 November), after which they are stall fed for the next four months. This varies slightly from year to year depending on the season. While herded, the flock graze the common rangeland in the hills and plains immediately around the settlements and return to the village in the evening, each to the house of its owner where they receive an evening feed. For two months of the year between Sawr and Jawza (21 April to 21 June), the shepherds take the flocks to higher moun-

⁴⁴ This is commonly practised in other places, but was specifically mentioned in Khalifa Rahmat.

⁴⁵ These are different in conformation to the "Arab" sheep of northeastern Afghanistan, and are raised for meat rather than for wool.

tain pastures about two hours' walk from the village, and members of the families who own sheep, including women, go with them. Once in the *ailaq* they live in black goat-hair tents. The ewes are milked once a day and the women make a variety of milk products. After the flocks return from the mountains they graze the stubble freely until they are cultivated.

For about four months of cold weather between Aqrab and Hamal the sheep and goats are housed and stall fed. Chopped straw makes up the bulk of the diet, mixed with chopped lucerne hay and crop residues. The straw of rainfed wheat or barley is considered to be the best. Certain wild plants of the thistle family are collected from the *dasht* in the autumn once dry and fed mixed with straw and hay. For those who can afford it, milled barley grain and cottonseed cake may be fed to in-lamb ewes in late pregnancy. The milled barley is mixed with damp chopped straw or hay.

Rams and breeding: Only those with a reasonable number of sheep keep rams for breeding. The rams are kept separate until Mizan (23 September to 22 October) and then run with the ewes for about two months until they come in for the winter at the end of Aqrab (21 November). For those who do not own a ram, service is free of charge. Most lambs are born during Hut (20 February to 20 March) or early Hamal. They are weaned in their third month. The process is quite sudden and marks the start of the main milking period in the mountains. Milking may start earlier according to family preference. Generally lambing percentage (successful survival to weaning) is about 80 percent, but may be considerably lower due to disease or unfavourable conditions.

Small ruminants: products

Milk products: During the two months of early summer when the sheep and goats are milked in the *ailaq*, women make a variety of products including yoghurt, buttermilk, butterfat, ghee, *chakka*, *qaimaq* and *qurut*. Families with a surplus produce ghee and *qurut* for sale in Herat.

Sale of sheep: The most common age of sale appears to be 6–9 months, as few people can afford to maintain surplus animals through the winter. Animals are sold in late autumn shortly before the sheep are housed for winter at the end of Qaws or the beginning of Jaddi (21–22 December). This provides some cash to buy essential supplies before winter (flour, clothes and other necessities). Those who must sell their ram lambs at a young age do not need to castrate them, but those who are able to keep male sheep on until they are 18 months to two years old prefer to castrate the lambs at about 20 days old. This is younger than in many other places. Villagers estimate that a two-year-old "Arab" wether in good condition may weigh 70 kg live weight or about 50 kg carcass weight. Owners prefer to take their sheep to sell in Herat themselves, but itinerant traders also visit the villages to buy animals which they walk to Herat.

Wool and weaving: In this region sheep are shorn once a year, in spring. The wool, goat hair and cashmere is retained for domestic use. There is a tradition of making carpets and kilims, and many households in Khalifa Rahmat have contracts with Herat traders who provide loans for looms and tools and, as necessary, also provide wool and dye. Although most of the dye is chemical (aniline), some vegetable dye is made locally from a plant known as "*rodang*" which produces a reddish colour (madder root, *Rubia tinctorum*). In addition to washing, carding, dyeing and spinning the wool, and making carpets and kilims, the women also make saddle bags and felts, and knit pullovers, gloves and socks. Goat hair is used to make tents and ropes.

Poultry: As in most villages many households in Khalifa Rahmat keep a few chickens, but only twelve households keep enough to have a surplus of eggs to sell or exchange with neighbours. A few families also keep turkeys or guineafowl. As few households have enough hens to be able to afford a “broody” hen, a cooperative system for raising chicks is commonly practised, known as “*morgh-i-nimagi*”, or chicken sharing. Several women agree that one of them keeps a broody hen to hatch a clutch of eggs, to which they all contribute. The selected hen raises the chicks until they are poults, at which time the survivors are divided equally between the women. Turkey and guineafowl eggs are usually brooded by a hen as these birds are not considered to be good mothers.

Pashtun Zarghun district

Pashtun Zarghun district is approximately 25 km east and upstream of Herat city in the Hari Rod valley. The river flows through the centre of the district from east to west and the main road from Herat to Chaghcharan in Ghor runs through the valley across the *dasht* north of the cultivated land. The settlements mainly lie along the right and left banks of the river, their land irrigated by a herringbone of traditional channels – many of ancient origin. Barren *dasht* stretches to the north and south of the riverine settlements. In years of exceptional rainfall, parts of the *dasht* provide a rare chance for opportunistic rainfed (*daima*) farming and some meagre seasonal grazing for sheep and goats. The Paropamisus mountain range that divides Herat from Badghis and Central Asia stretches north of the *dasht*. Scattered along the spring-line that marks the foot of the range, a number of small settlements eke out a livelihood from irrigated grain and pulse crops, and flocks of goats.

Three communities in Pashtun Zarghun district were selected for this study’s primary research sites: two riverine settlements irrigated from the Hari Rod, Tunyan Mian Deh and Gawash; and one spring-line village, Ghorak. Only Tunyan Mian Deh and Ghorak were visited for this livestock component of the project, and distinct differences were noted between these two communities.

Tunyan Mian Deh

Social and agricultural profile

Tunyan and the other primary research site, Gawash, lie on the Atishan canal which serves a total of ten settlements. Tunyan Mian Deh is part of a large and complex community and one of four *mahalla* (quarters). Although this study concentrates on one *mahalla* it should not be overlooked that all four operate as parts of a single community represented by a single *wakil*.⁴⁶ The following description of livestock husbandry and agriculture applies equally to all. The ethnic and tribal makeup of “greater” Tunyan is complex, and the social and economic dynamics of the community reflect this. The population comprises a mixture of Pashtun and Persian-speaking (*farsiwan*) clans long settled here; now are all Persian speaking.⁴⁷ All are Sunnis and there does not appear to be serious intertribal or ethnic conflict. The pattern of land ownership includes a few large (mainly absent) land owners, small land owners, leaseholders (*kishtamand*) and sharecroppers (*dehqan*, *bazgar*). Agriculture is all irrigated; there is no rainfed crop land. Livestock husbandry is completely integrated with, and dependent on, the cropping system. According to the villagers almost 80 percent of men aged 17–35 are away either working in Herat or in Iran, and remittances make a significant contribution to villagers’ livelihoods.

⁴⁶ These are: Masjid-i-Jame, Qala-i-Kohna, Gaw Khoran and Mian Deh.

⁴⁷ These include: Ghalji (Ghilzai), Mashwani, Nurzai, Tarin as well as Farsiwan (Tajik), Taimani and Sayeds.

Cropping systems

Tunyan land is irrigated from the Atishan canal with its head works on right bank of the Hari Rod. There is a problem with the many side washes that cross the canal and flooding that consequently damages it several times a year. From 1999 until the spring of 2005, drought and inadequate snow in the central Hindu Kush meant that there was a shortage of summer water in the Hari Rod. These problems impeded agricultural production. There are two main seasons for cultivation and sowing: late autumn/early winter, and spring. Wheat, the main subsistence crop, is sown during Aqrab and Qaws (23 October to 21 December), as is Persian clover. Some barley, millet and cotton and a variety of legumes and pulses including broad beans, field peas, lentils, chick pea and a legume locally named *shamlit* are sown between Hamal and Sawr (21 March to 21 May). Clover is cut two or three times, the early cuts for green forage the last cut for seed, with the residue fed to livestock. Wheat and barley straw are kept for feed, as are the crop residues from the pulses. If there is sufficient water some potatoes are planted. Some lucerne is cultivated and maintained for 5–8 years before being ploughed. Water permitting, five and even six cuts a year can be obtained, the early cuts for green forage the later cuts for hay. A late crop of barley may be sown for green forage which is cut in late autumn. A wide variety of vegetables are cultivated for household use including root vegetables. Fruit trees are planted for household use rather than commercial sale.⁴⁸

Livestock husbandry and production

Large ruminants: cattle

Milk cows and calves: According to the villagers, 18–20 out of 36 households in Tunyan Mian Deh own milk cows. Milk is produced for household consumption, but it may be shared with neighbours if in surplus. With the other three *mahalla* of the greater Tunyan community, there are sufficient cattle to warrant hiring a community herdsman. The herdsman collects the cattle in the morning and takes them out to graze for the day in whatever open spaces there are around the cultivated land and along the river. In the evening they are brought back and the animals return their own houses, where they are given an evening feed. After the harvest the cattle graze freely across the stubble and crop residues until the land is cultivated again. The herdsman is paid half a *man* (2 kg in Herat) of wheat per month for an estimated 9 months' work. The cattle are herded between Hamal and Qaws (21 March to 21 December) if the weather is open, or for less if it is inclement. From the end of Aqrab to the end of Hut (21 November to 20 March) they are stall fed three times a day, mainly on chopped straw mixed with lucerne hay or crop residue. Lactating cows may be fed some milled barley or the pulse known as *shamlit*. Cotton cake is sometimes bought from Herat if available and if the family can afford it.

Bulls and breeding: There are reported to be two or three bulls in Tunyan, but none of good quality. For those who wish their cows to be served by a better quality bull there is said to be a one in the neighbouring village of Deh Shikar. No fee is charged for the service. As elsewhere, heifers rarely have their first calf before their third year, and thereafter, if in good condition, they may have a calf each year but more commonly every 18 months. Lactations seldom last more than 9 months and often as little as 6 months.

⁴⁸ These include white mulberry, apricots, plums, quince, figs, pomegranates and grapes.

Large ruminants: products

Milk products: Cows milk is produced solely for domestic use but may be shared or exchanged with neighbours if in surplus.

Sale of cattle: Heifers are raised as replacements, and bull calves which are not raised to be breeding bulls or plough oxen will be slaughtered or sold at an age convenient to their owners.

Plough oxen: Around eight households out of 36 in Tunyan Mian Deh have at least one ox. Families with only one ox arrange to share cultivation with another family who have one to make a pair. DACAAR estimated that about half the land in Tunyan is still cultivated with oxen and half with tractors. Working oxen may be fed grain.

Small ruminants: sheep and goats

The total number of sheep and goats of all ages and sexes in greater Tunyan is about 250. The breeding flock in Tunyan Mian Deh is probably no more than 60 head. About 70 percent are sheep and 30 percent are goats. Around 20 households out of 36 in Tunyan Mian Deh own a few sheep each, mostly no more than two or three. One person owns about 30 animals.

Grazing, management, herding and feeding: The community employs a shepherd, who is paid one lamb in ten (surviving until weaning). The owner of the lamb selected is compensated by the other owners in proportion to the number of sheep and goats they own. This seems to be the general custom in the Hari Rod valley. Sheep and goats are grazed out every day for most of the year unless the weather is very cold. They are grazed over whatever open land is available around the edges of the cultivated land, along the river and out on the *dasht* to the north of the main road.⁴⁹ After the harvest they are grazed on the stubble and crop residues until the land is ploughed. The shepherd collects the animals in the morning and they return in the evening to their own houses where they are stall fed.

Rams and breeding: Only those with more than one or two sheep keep a ram for breeding. Rams are kept separate from the rest of the village flock until Mizan (23 September to 22 October) when they run with the ewes for about two months until the weather gets cold. Most lambs and kids are born in Hut (20 February to 20 March). Lambs and kids are gradually weaned by the end of the third month.

Small ruminants: products

Milk products: The family shares the milk with the young animals, so a cloth is tied over the mothers' udders to prevent them taking too much. Both ewes and goats are milked and the milk processed into yoghurt, buttermilk, butterfat, ghee, *qaimaq* and *chakka* and. Milk products are primarily for domestic consumption although any surplus may be shared or exchanged with neighbours. There is also a tradition in Tunyan of making a form of white cheese. The starter for this is obtained by slaughtering a newly suckling kid and extracting the rennet from the first stomach.

Sale of animals: Ram lambs not required for breeding are castrated at between one and two months, before the weather gets too warm. The preferred age for sale is

⁴⁹ Between the Tunyan crop land, the main road and the *dasht* beyond lies an area of about 20,000 *jerib* (4,000 ha) owned by three families now living abroad. The land is currently farmed by long-term sharecroppers. As there is a shortage of irrigation water, only a third of the land is cropped each season and the Tunyan shepherds take sheep and goats to graze across the fallow land and the *dasht* beyond the main road. They are afraid that if and when the Khanabad canal is repaired, all this land may come under cultivation – effectively depriving them of grazing land.

one to two years old, but this depends on family necessity – some may be compelled to sell their animals earlier at 8 or 9 months old. The preferred time to sell is the late autumn or early winter (Aqrab or Qaws). Itinerant traders may come to the village, but most people prefer to sell their own sheep in Herat. Sometimes several people band together to walk the animals there.

Wool and weaving: Sheep are shorn once a year in spring. Most of the wool and goat hair is kept for household use, but individuals with more sheep may sell wool in Herat. There is a tradition of making carpets and weaving kilims in Tunyan under contract with Herat traders who provide advances for looms, tools as well as wool (if not available) and dye. Tunyan women specialise in making 2–3 m² prayer rugs for which the traders provide the designs. Carpet making is an activity that is undertaken all year according to the women's availability. It is a joint family enterprise, with half the proceeds going to the men and half to the women. All women weave carpets – young and old, unmarried and married – with the older women teaching the young girls. Wool is also washed, carded and spun and used for knitting garments or stuffing mattresses.

Poultry: Almost all households keep some poultry – mainly chickens, but also turkeys and a few guineafowl. Most households keep four or five chickens and a cockerel, but only certain skilful women raise chicks. Like in Khalifa Rahmat, the system of *morgh-i-nimagi* is practised in which several women band together to share a broody hen, with each woman contributing some eggs to be brooded. Later the surviving poult are divided between the women.

Pashtun Zarghun Ghorak

Ghorak is a small, poor, drought-stricken settlement of huddled mud brick houses on the spring-line at the foot of the Paropamisus range, about 5 km across the *dasht* north of the main road. It is one of three closely related settlements belonging to a single *manteqa*, each with its own source of water but considered as one extended community. The three settlements are represented by one *wakil (arbab)*: Khayrabad with 20–25 households; Khwaja Dara with 10–12 households; and Ghorak with 18 households. Ghorak was fought over and suffered damaged during the Soviet war, and was also severely affected by the drought of 1999–2003. The people are Alakozai Pashtun, probably originally *kuchi* but long settled and now Persian speaking. They show an aptitude for herding, practise a modified form of seasonal transhumance, and still use black goat hair tents in certain seasons. From every household, men are away working in Herat and Iran, and without their remittances it seems that the community could barely survive.

Cropping systems

Water for irrigation comes from a spring in a small valley about 800 m behind the village, which provides a limited amount of water to irrigate terraced fields on the slopes below the village. Agricultural possibilities are limited and the drought that lasted almost five years caused the area of cultivation to contract substantially. Although the flow improved in 2005, there are still unnecessary water losses from seepage along the line of the channel.⁵⁰ There is some *daima* land which in years of exceptional rainfall may be cropped to some extent. Between 1999 and 2004 almost no crop was harvested, but the 2004–05 season was much better. Land holdings are very small; they are farmed by the land owners or shared between close relatives and neighbours. Lack of irrigation water limits the choice of crops that can be

⁵⁰ Work is ongoing to try and improve this situation under the NSP Programme, facilitated by DACAAR.

cultivated and the harsh conditions have led people to identify a number of drought-tolerant species of legume and pulses. As there is insufficient water to irrigate all of the crop land every year, a system of alternate year fallow rotation is practised, but recently drought has meant that in some years almost no crop has been obtained. Wheat, if cultivated, is sown in the autumn, but most crops are spring sown. These include barley and two highly drought-resistant legumes, *talkhak* and *shamlit*,⁵¹ which need no more than two irrigations. The seed of both these legumes are milled and used to feed livestock. It is claimed that under these conditions both yield better than wheat, and the pulse is exchanged for wheat grain with the owners of livestock from the villages along the Hari Rod, such as Tunyan. If there is sufficient irrigation water they also cultivate lentils, chick pea and white cumin. There is no possibility of cultivating fruit trees.

Livestock husbandry and production

Large ruminants: cattle

Before the drought a few families kept a milk cow, but there are none at present as there is insufficient fodder and the grazing is too poor for cattle. Neither is it possible to maintain a pair of plough oxen. When they need to cultivate their land they rent a tractor from one of the riverine villages, which costs 500 Afs per hour.

Small ruminants: goats

Before the drought a few sheep were kept, but these were all sold when the flock was downsized and now the villagers only own goats. Every household has a few goats, but only two families have more than two or three. One person owns fifteen and another 30 animals. At present the total Ghorak goat flock is about 100 head.

Grazing, management, herding and feeding: The community employs a goatherd who, according to local custom, is paid one kid in every ten successfully reared to weaning. The other two settlements, Khayrabad and Khwaja Dara, have separate flocks. For eight months of the year between Hamal and the end of Aqrab (21 March to 21 November) the goats are grazed out on the *dasht* and in the mountains surrounding the villages to which they believe they have a claim.⁵² In early summer during Sawr and Jawza (21 April to 21 June) the goats are taken about two hours' walk into the mountains to the north of the village to a higher altitude for early summer grazing. Members of each family go up to this *ailaq*, where the women milk the goats and make a range of products. At the end of June or early July the flock returns to graze the stubble around the village after the harvest. For the rest of the year they grazed on the open *dasht* within walking distance of the village, never more than one or two hours away. Towards the end of Aqrab or the beginning of Qaws (21–22 November) the goats are brought back to the village and housed for the next four months until the end of Hut (20 March). During winter they are fed straw and crop residues and additional straw may be bought from the riverine villages. There is not enough irrigation water to cultivate lucerne and the villagers cannot afford to buy hay. They feed milled pulses (*talkhak* and *shamlit*) and barley if available, when absolutely necessary. As there is no mill in the village they must go to one of the riverine villages such as Tunyan to have their pulses ground. There is a good market for *talkhak* and *shamlit* in the riverine villages and, if in surplus, these may be exchanged for wheat.

⁵¹ These two legumes are yet to be botanically identified; they may be species of vetch, *Vicia sp.*

⁵² According to the villagers they were given official rights to grazing on all the mountains and plains draining south from the mountain ridges behind the village to the main road. The land registry office in Herat disputes this claim.

Billy goats and breeding: Only those with more than one or two goats can afford to keep a billy goat. These run with the flock all summer apart from the months of Saratan and Asad (22 June to 22 August). There is no service fee charged.

Small ruminants: products

Milk products: When in the summer camp in the mountains, female goats are milked and the usual products are made. Those with a surplus make butter and *qurut* for sale in Herat, but milk products such as *chakka*, butter and cheese are stored in goatskins for domestic consumption in winter.

Goats: Young males not required for breeding are castrated at 1–6 months old. Surplus males are usually sold at 1–2 years old in late autumn (Aqrab/Qaws), but this depends on economic circumstances. If sold at 8–9 months it may not be necessary to castrate. Animals to be sold are walked to Herat, which takes about 24 hours with an overnight stop.

Goat hair and cashmere: Goat hair is spun and used to make tent ropes, and woven into the goat hair tents which are used by the goatherd and the families who go to the mountains in early summer. The under-fur or cashmere is sold in Herat and can fetch a good price if it is the right colour. An adult goat may produce as much as 700 g of hair and 300 g of cashmere. One *man* (4 kg in Herat) of white or yellow cashmere can fetch 3,000–4,000 Afs (US\$62.50–\$83). Black cashmere only fetches between 300–500 Afs per *man* or US\$1.60–\$2.60 per kg. Most of the goats are black.

Wool and weaving: Although they do not keep sheep and have no wool of their own, the women of the three villages make carpets on contract to traders from Herat. The traders provide the wool, dye, credit for looms and tools and the designs. Before the drought, when they did have some sheep, they made felts and shepherds' coats.

6. Findings from Nangarhar

6.1 Achin district

Achin district is southeast of Jalalabad in the piedmont of the Spin Ghar Mountains that here forms the frontier with Pakistan's North West Frontier Province (NWFP). Village settlements in Achin are spread out along seasonal flood streams (fed by melting snow) that flow north from the mountains through foothills of dry alluvium towards the valley of the Kabul/Kunar River. In some locations *karez* have been dug into the alluvium which provides irrigation water to some villages. The altitude of Achin settlements range from 600 m.a.s.l. to over 2,200 m.a.s.l.

This is an area noted for the independence of its Pashtun tribes, the Shinwari and Mohmand, whose clans occupy the frontier. Land holdings are fragmented and small, and an agricultural livelihood is earned only with great difficulty. The snow melt streams are unreliable and subject to periodic drought. Smuggling, the cultivation of opium poppy, the production and processing of narcotics and the export of migrant labour to Pakistan and the Arab countries have been a way of life and livelihood for generations. All economic pursuits, including livestock husbandry, play a secondary role to opium, smuggling and migrant labour.

Insecurity in Achin meant that it was not possible to visit the four settlements identified as primary research sites. However a number of community leaders from each of these settlements came to Jalalabad and were interviewed by researchers there. The two upper Achin settlements were considered together as they form part of the same *manteqa* and tribal family that has access to mountain grazing and forest resources. Being closer to the mountains, irrigation water is not such a critical issue as it is further downstream – although lack of land is. The two lower settlements are considered together as both suffer serious shortages of irrigation water. Livestock husbandry is of more importance in upper Achin than in the lower villages where it is of minor importance. Opium poppy is the dominant crop in all sites.

Upper Achin villages: Otarkhel and Khawaji

Social and agricultural profile

Otarkhel and Khawaji are twin settlements that consider themselves part of the same community, and representatives from both settlements were interviewed together. According to the elders there are about 100 households (*qala*), including 300 families in Otarkhel and 60 households in Khawaji. The inhabitants of these two settlements are Shinwari Pashtuns of the Abdul Rahmankhel clan and the Otarkhel sub-clan. As the original settlement at Otarkhel expanded, some families moved up the valley and establish a settlement at Khawaji. The Otarkhel share the Paikha valley in which they live with two other closely related branches of the Abdul Rahmankhel, the Perukhel and the Thawoskhel. The natural resources of the Paikha valley, including the grazing and the forest, are shared between these three clans. Although sheep and goats are kept and some crops cultivated, the main basis of the rural economy of Achin has been the cultivation of opium poppy and the trading and smuggling of narcotics and other goods across the Pakistan frontier.⁵³ Processing of heroin is reported to take place in some of the mountain valleys. Irrigation water is provided from channels that draw water from the mountain torrents. Khawaji and Otarkhel share their water resources with several other villages further downstream.

⁵³ It is reported that a number of heroin "laboratories" operate, if not in the Paikha, in the neighbouring mountain valley.

Land holdings are very small, sufficient for just less than half a *jerib*. This applies even to the elders and *malik* as inheritance has divided land over many generations: even leading community elders and *maliks* own less than one *jerib*. Many families have members working abroad, mainly in Pakistan and Arab countries. Land is farmed by land owners as well under sharecropping arrangements with relatives. There are no large land owners. The Taliban ban on opium in 2001 meant that many families fell into debt, and mortgaging land (*giraw*) became widespread. In 2002–04, farmers throughout Achin cultivated opium again and debts were paid off, but in 2005, with increasing pressure on poppy farmers not to cultivate and some eradication, there are indications that *giraw* is again on the increase.

Cropping systems

Irrigated cropping includes opium poppy, cannabis, wheat, barley, maize, fodder crops, legumes, pulses and vegetables. By their own admission, the elders of Khawaji and Otarkhel state that their most important crop is opium poppy. This is sown in late autumn or early winter and harvested in April or early May. Some wheat, barley and clover are cultivated, but opium takes precedence. As land holdings are small and families large, no other crop can give them the same return.⁵⁴ They claim that there is no choice other than to grow opium or migrate to Pakistan or elsewhere to find work. Even while cultivating opium, almost every household sends family members to work in Jalalabad or abroad. It is difficult to practise crop rotation and this has led to increasing problems with pests and diseases in the poppy crop. Without much wheat there is little straw for feeding livestock. Opium, wheat and clover are all sown in early winter. Clover may be under-sown in the grain crops. About three to four cuts of clover can be obtained for feeding as green forage to livestock. The final cut is left for seed and the residue fed to stock. Very little lucerne is cultivated here. Vegetables are grown in household plots for domestic consumption. A popular summer crop is cannabis (*bang*, *Cannabis sativus*). Some maize is also cultivated in summer – a local type that matures in about 90–100 days. Maize grain is used for human consumption, but the green thinnings and the dry stover are used for feeding stock. A vetch-like legume known as “*mort*” is intercropped with the maize and also fed⁵⁵ to livestock. Apart from walnut trees, some white mulberries and wild pine nuts,⁵⁵ no other fruit of any significance is produced. As more pressure is brought to bear by the Afghan government backed by the international community, farmers in Achin are being encouraged to think of alternatives to poppy.⁵⁶

Each of the three Abdul Rahmankhel clans, Otarkhel, Perukhel and Thawoskhel, and their six sub-clans, share grazing and forest rights to the Paikha valley. By mutual agreement they have divided the valley into three parts: a third for each clan for the purpose of collecting firewood and pine nuts.⁵⁷ They have also formed a tribal committee to control the use of forest resources.

Livestock husbandry and production

⁵⁴ For example, one of the elders farms only half a *jerib* of land, from which he supports the seventeen members of his immediate family.

⁵⁵ The Jalghoza pine (*Pinus gerardiana*) has traditionally provided a valuable source of income for these mountain communities. Unfortunately, over the past 30 years the forests have been decimated by the harvesting of both timber and firewood.

⁵⁶ GAA is supporting a project in Achin to encourage the cultivation of roses for oil and “*attar*” of roses. They have about 34 demonstration *jerib* planted so far. This is likely to be a long-term project and although it looks promising from an agronomic point of view, the benefits of the market have yet to be demonstrated to the farmers. There are no rose demonstrations as yet in Otarkhel or Khawaji.

⁵⁷ This is an entirely local initiative that owes nothing to the government or any other agency.

Large ruminants: cattle

Milk cow and calves: According to the elder about a quarter of the households in Otarkhel and 10 percent of households in Khawaji have a milk cow.

Daily and seasonal management, herding and feeding: There are not enough cattle to warrant hiring a community herdsman. Cattle are kept in or near the houses of their owners. They are tended by the family and grazed along the verges of the cultivated land, irrigation ditches and roads. Green forage and weeds are fed in season, including clover, weeds, poppy and maize thinnings. During the cold months the cattle are housed and stall fed on straw and crop residues. If available some supplementary feed may be fed to lactating cows in the form of milled barley mixed with damp chopped straw. Maize grain may be fed, but this is mainly used as a human food. If maize is fed to cattle, the grain is fed whole and not milled.

Large ruminants: products

Milk products: Cow's milk production is low, and it is used only for household consumption or shared with neighbours. Heifers seldom calve before their third year and lactations are seldom longer than 9 months, often shorter. The usual mixture of milk products is produced. Any household with a surplus will share with neighbours or exchange for other necessities.

Bulls and breeding: Only one person in Otarkhel has a bull, but they claim it is a good bull and many people from other villages bring their cows to be served by it. No fee is charged for the service. There is no bull in Khawaji.

Plough oxen: Only two families in the two settlements own oxen. Although there is no tractor in either settlement, the villagers prefer to rent one from a neighbouring village. This costs 500 Pakistani rupees per hour (approximately US\$8). Few people can afford to maintain a pair of oxen for 12 months, and hiring a tractor is seen as more cost effective. Oxen are still needed to plough awkward places and terraces where it is difficult for a tractor to access.⁵⁸

Small ruminants: sheep and goats

In Otarkhel 30–35 percent of households own sheep or goats. In total the village flock amounts to about 150 animals, of which 40 percent are sheep and the rest goats. No one has more than two or three animals and there are no big flock owners. In Khawaji there are about ten sheep and 50 goats.

Daily and seasonal management, herding and feeding: In Otarkhel the community hires a shepherd who is paid 2 *man* (1 *man* is 5 kg in Peshawar) of wheat and 2 *man* of maize grain per head. In Khawaji, which only has 60 animals, they have banded together with the neighbouring two villages of Mirai and Issakhel to form a joint flock of 120 head. They share a shepherd, who receives the same payment as the Otarkhel shepherd. The flocks are grazed on the open country immediately surrounding the villages all year, returning to their individual houses at night. They are only housed during the day in bad weather. After the harvest they graze the stubble until cultivation starts. In Khawaji, which is situated at a higher elevation, the animals of the three settlements flock together in the Paikha valley. The climate is colder at this altitude so it is necessary to house the animals for some weeks during

⁵⁸ GAA manages a credit programme to assist poor farmers in Achin to buy a milk cow or a pair of oxen. The loan must be repaid in eighteen months. No such credit has been given to anyone in either Otarkhel or Khawaji. In Achin it is difficult to see how such a loan could be paid off in any other way than cultivation of opium or from migrant labour.

winter. There appear to be no seasonal divisions of the mountain grazing. Sheep and goats return to the settlements each evening where they are stall fed. If no green forage is available chopped straw is used. Little if any grain is fed to sheep and goats unless they require special care or are being fattened for a celebration.

Rams and breeding: Few families keep a ram or a billy goat for breeding, and there does not seem to be a custom of keeping them separate from the rest of the flock out of the breeding season. Nonetheless, most lambs and kids are born in late winter during Hut (20 February to 20 March). It was reported that 40–50 percent of ewes and female goats abort their young, which indicates that they have a serious health problem (possibly *Brucella abortus*). For the first weeks following birth, the lambs and kids are kept at home during the day or taken out close to the *qala* until they are strong enough to go out to graze. They suckle their mothers when they return in the evening. Once they are strong enough to go out with the flock, cloths are tied over the udders of the ewes and nanny goats to prevent the young taking too much of their mothers' milk.

Women are responsible for milking the animals and preparing the various milk products. The main milk products produced are yoghurt, buttermilk, butter and ghee. No *qurut* or cheese is produced. Everything produced is for household consumption, and there is little surplus available for sale or exchange with neighbours.

Sale of animals: Males, surplus to household requirements, may be sold, but there is not much surplus at present. Few families have more than two or three breeding females and the lambing rate appears to be exceptionally low because of abortion. Most households keep their male lambs and kids for their own consumption or for celebrations such as weddings or the *Eid-i-Qurban* sacrifice.

Wool and weaving: Sheep are shorn once a year and wool or goat hair is kept for making handicrafts such as donkey saddle cloths and other household purposes, rather than being sold. There is no tradition of weaving carpets or kilims. Little use appears to be made of goat hair or cashmere.

Middle and lower Achin villages: Sra Qala/Landi and Maruf China

Social and agricultural profile

Sra Qala and Landi form a twin settlement which considers itself a single community. According to the elders there are a total of about 100 households (*qala*). The inhabitants are Shinwari Pashtuns of the Sepai clan. The village is close to the Achin district centre and administration. Maruf China lies a few kilometres to the north of Achin bazaar on an alluvial fan overlooking the stony plain that slopes down to the Nangarhar canal and Batkot district. According to the elders there are a total of about 150 households (*qala*). The inhabitants are all Sayeds,⁵⁹ and all are descended from two brothers. For many years the basis of the agricultural economy of both Sra Qala and Maruf China has been the cultivation of opium poppy. In the case of Sra Qala, proximity to the district administration (*woliswal*) in Achin bazaar gives rise to a certain measure of caution about poppy cultivation. In an interesting insight into perceptions, and possibly a reflection of past relationships with the provincial government, one interviewee stated, "We do not have a licence to cultivate poppy at present." Livestock husbandry is of little significance in either of these settlements. Sra Qala shares a water source with six communities upstream of

⁵⁹ Those who claim descent from the Prophet Muhammad through his daughter Fatima and his son-in-law and nephew Hazarat Ali.

Achin and one community downstream, and also with the government which has claim to 84.5 *jerib*.⁶⁰ Together Sra Qala and Landi only have rights to only one *shab o roz* (24-hour water rotation) out of 30 for the total water source. The drought (1998–2003) seriously reduced the supply of irrigation water and the area under cultivation. The 2005 season saw an improvement, but shortage of irrigation water remains a major constraint to crop production. In Maruf China, agricultural land was originally irrigated from four shallow *karez* tapping an aquifer in the alluvium. As a result of drought the flow of water has been greatly reduced, although this improved slightly in 2005. Only one *karez* still flows all summer, while the other three flow to some extent in spring. They do not share water with other communities. Three wells have been dug for irrigation water, but the additional water has not proved significant. In Maruf China the average landholding is about 5 *jerib*. In practical terms, drought means that no more than a quarter of the land is actually cultivated.

Cropping systems

Irrigated cropping includes opium, wheat, barley, fodder crops, legumes and pulses. The elders of both Sra Qala and Maruf China admit that opium has been their dominant crop for many years. Land holdings are small and water resources too meagre to practise good rotation, and no other crop can provide the same return. They admit that growing poppy on the same land year after year leads to problems with weeds, disease and pests, however opium still gives them a better return than anything else. In normal years, they cultivate a little wheat, barley and Persian clover, although cultivation of these crops has been limited. In the past some lucerne and also possibly berseem clover was cultivated. If water is sufficient it is possible to get three to four cuts of clover and up to five or six of lucerne. Few livestock are kept in either Sra Qala or Maruf China and cultivation of fodder crops is insignificant. Some short-maturing maize and mung bean are cultivated by those with sufficient water as well as vegetables in household plots within the walls of the *qala* for household consumption. A few onions are sometimes cultivated as a cash crop. There is insufficient water for commercial fruit production. There is no rainfed agriculture in Maruf China although in Sra Qala opportunistic use may be made of flood water. Shortages of straw, hay and forage limits the number of animals it is possible to keep.

Livestock husbandry and production

Large ruminants: cattle

Milk cows and calves: In Sra Qala there were more milk cows before the drought; now only eight households keep a cow. Prior to the drought most households in Maruf China kept a milk cow and some owned two or three. At present only 50 out of 150 households own a cow and no one has more than one cow.

Daily and seasonal management, herding and feeding: Cows and their offspring graze round the edges of the cultivation and are also fed them on the usual mixture of green forage, weeds, crop thinnings and dry feed.

Bulls and breeding: There is no bull in either Sra Qala or Maruf China and cows must walk to a neighbouring village where there is a bull to be served. There is no charge for the service. In Batikot there is an AI clinic, but it is not well thought of. Cows have to be taken back repeatedly to be served, which is time consuming. When the

⁶⁰ This was originally reserved by the government to grow forage for the horses of a mounted frontier guard. It is now leased but rarely used.

AI is successful, the calf tends to be too big for their small cows, which sometimes die calving.⁶¹

Plough oxen: There are no plough oxen left in either Sra Qala or Maruf China. Everyone hires tractors from Achin, Batikot or from neighbouring villages at a charge of 400 Pakistani rupees (US\$6.70) an hour. This is seen as more cost effective than having to maintain a pair of oxen for twelve months.

Large ruminants: products

Milk products: Milk is produced only for household purposes or sharing with neighbours and the usual mixture of products are made, including yoghurt, buttermilk, butter and ghee. The cows are small and as in most places most heifers calve in their third year. Lactations seldom exceed 9 months and are often much shorter.

Sale of cattle: Heifers are retained as replacements. Bull calves sold or retained as needed by individual households.

Small ruminants: sheep and goats

Prior the drought there were more sheep in both Sra Qala and Maruf China. There are now so few left in Sra Qala that they have great difficulty finding even a single animal for the *Eid-i-Qurban* sacrifice. At present there are only six sheep in Sra Qala and three or four goats in Landi. In Maruf China there are only eight ewes, which are part of a credit programme managed by Bangladesh Rural Advancement Committee (BRAC). Apart from these, there are about 150 goats in the village. Most households have one or two goats. In both Sra Qala and Maruf China, animals are grazed round the edges of the cultivated land, on the open land surrounding the villages and over the stubble and crop residues after the harvest has been cleared. Each family is responsible for their own animals (cattle, sheep and goats). There are not enough animals to warrant hiring community herdsmen, although in Maruf China there used to be a village goat herd. The usual mixture of green forage, crop residues and dry feed (mainly chopped straw) are fed as available. Cattle graze out all the year during the day except when the weather is inclement.

Breeding: A few billy goats run with the Maruf China goat flock. Kids are born in different seasons, but most in the month of Hut (20 February to 20 March). Until they are strong enough to run with the flock, the kids remain at home and suckle when the flock returns home in the evening. Once they are strong enough to go out with their mothers, cloths are tied over the nanny goats' udders to prevent the kids taking too much milk. The women milk the animals and make the usual products for household consumption, apart from *qurut* which is kept for household consumption.

Sale of animals: In neither in Sra Qala nor Maruf China are there many surplus animals for sale.

Wool and weaving: Goat hair is used for making saddle cloths for donkeys. It is not sold and there is no commercial production of cashmere. There is no tradition of weaving carpets or kilims in either of these communities, nor does this appear to be tradition in Achin.

6.2 Batikot district

Batikot district is situated 33 km east of Jalalabad, astride the main Jalalabad–Torkham road. The people are Pashtuns of the Mohmand *qawm*. Agricultural oppor-

⁶¹ The AI centre in Batikot gets Friesian and Holstein semen from Pakistan.

tunities are considerably better than in Achin, and were much improved in the 1960s and 1970s when the Soviets constructed the Nangarhar canal (completed in 1972). The canal ends in Janikhel village. It is possible to cultivate a wide variety of crops and practise multiple cropping (which includes opium poppy). Livestock husbandry is dependent on, and completely incorporated into, the cropping system and mainly includes cattle and a few water buffaloes. Sheep and goats are of little significance and there is no common grazing of any value.

Janikhel

Social and agricultural profile

Janikhel, in the centre of Batikot district, is a large village of about 450 households (*qala*) divided into two sections, upper and lower. Its inhabitants are Mohmand, who claim to own approximately 2,000 *jerib* of land. Despite having comparatively better land and water, almost every household has at least one or more family members working abroad, mainly in Pakistan, the Arab countries and Iran, but even in the UK and the US. In the absence of provincial management the inhabitants of five tribally related Mohmand villages (Janikhel, Shomakhel, Alikhel, Nassirkhel and Badlukhel) have managed their water themselves since the 1980s. Janikhel is situated at the end of the Nangarhar system, and although the upper part of the village has sufficient irrigation water the lower part has problems. The formal land settlement was established in the early 1970s during the reign of King Zahir Shah, but after several generations of inheritance and division, average land holdings are now about 4.5 *jerib* (ranging from 1–10 *jerib*). There is no common grazing land. The location of Janikhel on the main road to Pakistan gives it a communication and trading advantage. There is an active bazaar in Batikot.

Cropping systems

Irrigated cropping includes a wide variety of grain, fodder crops, legumes, pulses and vegetables cultivated according to a double-cropping system. All the arable crops in Janikhel are irrigated and it is possible to get two and even three (vegetable) crops a year, except in the lower village where water is scarce. The winter-sown crops include opium poppy as well as wheat, barley, clover (both Persian and Berseem) and winter-planted potatoes. Up to five cuts of clover may be obtained, with the final cut left for seed and the residue fed to stock. Despite the opportunities for mixed cropping, opium poppy has been cultivated in Batikot since the late 1980s (usually discreetly out of sight of the main road).⁶² Late winter- and early spring-sown crops include vegetables such as tomatoes, eggplant, okra, cucumbers, melons, spinach and onions. Cotton is sown in spring as a full-season crop harvested in late autumn, and there are several small private gins in Batikot. Two types of sugar cane are cultivated, one for chewing and one for juice or gur (unrefined sugar). Taro (*Colocasia esculenta*) is cultivated in flooded plots and the tubers harvested in early winter. Summer-sown crops include maize, mung bean and some rice. Maize is cultivated both as a grain crop and as a forage crop. Late summer-sown vegetables include cauliflower, carrot, turnip and white radish harvested in the winter. All these crops, directly or indirectly, provide feed for livestock. There is no commercial fruit production in Janikhel, but farmers keep a few fruit trees for household consumption.⁶³

⁶² In the 1990s, during the governorship of Haji Qadir, it was common to have demonstrations of poppy eradication laid along the road side in Batikot for the benefit of the press and the UN, while out of sight of the main road acres of poppy flourished untouched.

⁶³ These include apricots, plums, grapes, white and black mulberry, orange, guava and persimmon.

Livestock husbandry and production

Large ruminants: cattle

Milk cows and calves: According to the Janikhel malik 50–60 percent of households in Janikhel keep a milk cow. A few keep two or three.

Daily seasonal management, herding and feeding: Each family looks after its own animals and there is no community herding system. The animals are stall fed at home on green forage, crop and vegetable residues including cauliflower leaves. They also graze the edges of irrigation channels, roads and verges of the cultivated land. Those who grow cotton get the seed back from the several small private gins in Batikot – unpressed cottonseed is fed to the cattle after soaking it for 24 hours. Milled barley may also be fed to lactating cows.

Bulls and breeding: There are a few young but poor quality bulls in the village. There is a government AI station in Batikot, although, as in Maruf China, few appear to have much faith in the quality of the semen used, or the skill of the technician:

I have had to take my cow six times to the clinic before she was in calf. This is a great waste of time that a poor man cannot afford.

The use of Friesian and Holstein semen (from Pakistan) also produces large calves which can prove a problem for the small local cows.

A popular breed in this part of Afghanistan is the “*Kunari*”, a small brown or brown and white animal, which has the reputation for producing good milk cows. As elsewhere, heifers usually calve for the first time in their third year, and calving intervals thereafter vary from one year to 18 months, depending on the condition of the animal. This is a problem here due to a shortage of bulls. Lactations seldom exceed 9 months.

Plough oxen: There are no longer any plough oxen in Janikhel. All cultivation and threshing is mechanised.

Large ruminants: products

Milk products: Cows are primarily milked for household consumption, but households with surplus milk sometimes sell yoghurt in the Batikot bazaar. A few water buffalo are kept in Janikhel and Batikot for milking.

Small ruminants: sheep and goats

In Janikhel only about five percent of households keep sheep, and in those cases only one or two animals are kept. There are a few milking goats. There are not enough sheep to warrant hiring a community shepherd and there is no access to good grazing areas. Some families who can afford to buy ram lambs of one and a half or two months old from the *kuchi* at about 1,500 Pakistani rupees (US\$25) in late winter or early spring to fatten through the summer and sell to the butcher at 5 or 6 months when they can fetch 5,000–6,000 Pakistani rupees (US\$83–\$100). This is a popular income-generating activity.

Daily seasonal management, herding and feeding: In Janikhel sheep are managed like the cattle. They are mainly stall fed on fodder and crop residues with some milled barley or soaked cottonseed if available, but they are also grazed out by family members along the verges of roads, irrigation channels and the cultivated land.

Wool and weaving: There is no tradition of carpet weaving in Janikhel.

Kuchi: A few *kuchi* groups spend winter in and around Batikot and along the Kabul/Kunar River. In Janikhel the settled villagers do not appear to have any serious problems with *kuchi* although some years ago there were conflicts when the *kuchi* grazed their flocks in the standing crops. This was during the time of the war and revolution when law and order had broken down.

Poultry

Most households keep poultry, including chickens, turkeys, guineafowl and, because of the plentiful water, ducks. Poultry of all kinds run free around the village, but they find their way to their respective homes at night. Turkey, guineafowl and duck eggs are hatched under chickens which are considered to be better mothers.

7. Findings from Laghman

7.1 The Khomarikhel *kuchi* (the Panj Pai group)

This small group of *kuchi* was visited by the research team in their winter camp in the Dasht-i-Panj Pai (Plain of Five Feet) in Laghman, about 8 km southeast of Mehtarlam. The camp was about a kilometre and a half into the *dasht*.

Social profile: tribal configuration and the winter camp

The Khomarikhel are Pashtun *kuchi*, one of many sub-clans (*khel*) belonging to the loose Ahmadzai confederation. They are divided into two groups. The group under study belongs to a clan that spends summer in the Panjsher valley, spring and autumn in the Shamali plain north of Kabul, and winter in Laghman. Here this clan is referred to as the Laghman Khomarikhel. Another Khomarikhel clan spends summer in the mountains above Arghandi to the west of Kabul and winter in the lower Kunar valley. The particular group being studied was camped at the foot of the Koh-i-Gul Ahram Mountain, in the Dasht-i-Panj Pai, an area of barren plain and rocky mountains in the Laghman valley. There were two encampments, one of about twenty tents at the foot of the mountain about a kilometre into the desert where there is a spring, and another of about fifteen tents close to the edge of the irrigated crop lands. This group of Khomarikhel will be referred to as the Panj Pai group. They have only used this site as a winter camp for the last two years. For the right to graze and camp here over winter they pay one *lakh* (100,000) Pakistani rupees to the Dargai, another *kuchi* clan who have given up being herdsman and now mainly work in Pakistan. The Dargai themselves have only doubtful title to this area.⁶⁴ The Laghman Khomarikhel have established six camps at different points in the valley, of which the Panj Pai camp is one. They are sited from halfway up the Alingar valley to the bottom of the Laghman valley. Despite the necessity of splitting into smaller camps for winter, the Laghman Khomarikhel consider themselves part of one clan and that operates as single socio-political group. The Panj Pai sub-group needs to be understood as an integral part of this greater social unit with camps scattered through the Laghman valley (box 1).

Box 1. Kuchi camps in Laghman Valley

Char Bagh	About 40 families* (downstream of Mehtarlam and to the east of the main Laghman River in the lower valley)
Panj Pai	About 20 families, but in two camps (downstream of Mehtarlam on the dasht east of the Laghman River)
Dasht-i-Gul Ahram	About 50 families (on the <i>dasht</i> immediately beyond Panj Pai)
Shelatak	15–20 families (immediately downstream of the confluence of the Alingar and Alishing rivers)
Kas Aziz Khan	About 80 families (not yet identified)
Sangar	About 100 families (further up the Alingar valley and immediately east of Kanda suspension bridge over the river; the original winter camp base for the Laghman Khomari Khel)

*A single household (or family) may occupy several tents. These are mainly secondhand UNHCR refugee or IDP tents from rather than the traditional, more spacious black goat hair tents.

In all sites the Khomarikhel have had difficulty establishing an officially recognised title to a winter camp. Even in Sangar, which they claim is their original historical winter camping ground, they only have informal rights. They find themselves in the

⁶⁴ The Panj Pai group had arrived in Laghman one month earlier, at the end of *Aghrab*.

unfortunate position of having to pay for the privilege of spending winter in the Laghman *dasht* – to whoever has the power to exert a stronger claim. They have no settled houses or winter villages, as do some groups of *kuchi*.⁶⁵ There is continuous conflict between them and the administration, and others who claim established rights. This research concentrated on the situation faced by the Panj Pai group, but this report refers to the larger Laghman group as appropriate.

The year is marked by movement between different seasonal grazing camps located at different altitudes. They spend the winter in Laghman, the spring and autumn in the Shamali plain north of Kabul, on the Dasht-i-Watkai near the Watkai pass not far from Bagram. For the summer they move to the top of the Panjsher valley for the mountain grazing to an area called Paryan towards the Anjuman pass.

The Laghman Khomarikhel 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)					

Winter: From the end of Aqrab (15–21 November) to the middle of Hamal (5 April) (four and a half months), the Khomarikhel are based in their winter camps in Laghman. Their flocks graze the sparse herbage that can be found on the plains and mountainsides, but this has to be supplemented by wheat, rice straw and grain purchased from the settled Laghman villagers. Also to supplement their incomes, poorer families with surplus men send them away to find labouring jobs in Peshawar and Jalalabad. The lambs are born while they are still in their winter camp and are still quite young when they start their spring migration.

Spring migration: They leave Laghman for the Shamali on about 15 Hamal (4 April). It takes about two weeks to reach the Shamali (Dasht-i-Watkai). They set off from Laghman across the Dasht-i-Baba, moving on to Bad Pash, Gandab (Gandaw) and Surobi. They stop for no more than three days in each place so that the animals can graze and rest. As far as possible they keep to the open *dasht* and away from cultivated land: "If we did not we would be killed!" From Sarobi they travel to Maifar, Pul-i-Charkhi, Deh Sabz and onto the Shamali (Bagram) and the Dasht-i-Watkai, which they reach at end of Hamal (20 April). The time this takes varies from year to year depending on the state of the grazing, security and other factors along the way. When on the move, the women, children and some men move with the baggage animals (donkeys and camels). They are responsible for striking camp in the morning, and move on as fast as possible to set up camp at the next night's stop. The herdsman with the sheep follow at a slower pace to allow the animals to graze and rest at midday. Women and children are also responsible for herding the lambs and kids strong enough to walk. Those that are too young are loaded on baggage animals or may be transported by vehicle if available.

Spring in Shamali and migration to Panjsher: Those with more animals stay only two months (Sawr and Jawza [21 April to 21 June]) in the Shamali on the Dasht-i-Watkai

⁶⁵ The Dargai, also originally *kuchi*, established a claim to the Panj Pai *dasht* by building a village on the *dasht* (now largely in ruins).

and then move up to the Panjsher valley. Those with few animals may stay in the Shamali all summer.

Summer in Panjsher: Those with more animals start to move up to the Panjsher at the end of Jawza (21 June). The lambs are stronger and can walk the rest of the way. In the upper Panjsher valley towards the Anjuman pass, the Khomarikhel have well-established and recognised rights to mountain grazing in an area known as Paryan. They claim to have no problems with the settled people of the Panjsher, who respect their rights of passage provided they avoid the cultivated land. They stay two and a half months in the Panjsher, until mid Sonbola (5 September) when they start to move back to Shamali.

Poor families with only a few animals remain in the Shamali all summer and the men find labouring work in Kabul. Even those families who do go to the Panjsher send men who are surplus to herding and camp duties to Kabul in search of work.

Autumn return to Shamali: At the beginning of the second week of Sonbola (5 September) they begin their trek from the Panjsher back to the Shamali plain which they reach towards the end of the month. They stay in the Shamali for about two months between the end of Sonbola (22 September) and mid Aqrab (5 November). During this period the young rams and caste ewes are sold. The rams and billy goats are put with the females in the middle of Mizan (about 5 October).

Migration from Shamali to Laghman: All animals surplus to those needed for breeding are sold before moving, but once the ram lambs and old ewes have been sold they move down towards Laghman, usually in mid Aqrab. The move from the Shamali to Laghman takes about ten days. This part of the migration is carried out at a faster pace than in spring as the grazing is poor and there are few incentives to dally. They arrive at their winter campsites in Laghman towards the end of Aqrab (21 November) and the cycle begins again.

The years of war and conflict: For about three years, during the worst of the fighting between the Soviets and the Afghan communist government against Ahmad Shah Massoud in the Panjsher, it was almost impossible for the Laghman Khomarikhel to reach their summer grazing camps in the Panjsher. During these years they had to take a circuitous route over the Salang pass, entering the upper Panjsher from the back over the Andarab pass. On one occasion they were attacked by Soviet aircraft near the bottom of the Laghman valley and report that 36 died in the clash.

During the civil war between the mujahedin and the Najibullah government, the Laghman Khomarikhel do not appear to have had any particular problems migrating. Nor did they experience undue difficulties when the mujahedin groups were fighting each other, as this was concentrated in Kabul. When the Taliban were fighting the Northern Alliance under Ahmad Shah Massoud, the frontline lay across their migration route in the Shamali plain, yet both sides recognised their right of passage – an interesting reflection on the paradoxes of life and conflict in Afghanistan.

Although there are differences in wealth between individual members, the group operates as a close-knit social unit with the better-off members of the group helping the less fortunate. If a family needs to borrow money for any purpose, they do so

from within their clan. As they admitted, “We are always on the move, who among the settled people and traders would trust us enough to lend us money?”⁶⁶

Large ruminants: cattle

Milk cows and calves: Cattle are not as important for the Khomarikhel as sheep and goats. Nonetheless, twenty families keep ten milk cows and their offspring.

Daily seasonal management, herding and feeding: As the grazing around the winter camp in Panj Pai is almost non-existent the cattle are fed during winter on rice and wheat straw purchased from settled farmers in Laghman. They are not fed grain unless they are very weak as it is not considered to be cost effective, but they may be fed dry stale bread. The cattle stay close to the camp and some milk is produced for home consumption during the seasons when the sheep and goats are not lactating. The cattle are small and production is low, with lactations rarely lasting more than 6 months. A heifer usually has her first calf in her third year. Although it is said that some cows bear a calf every year, they admitted that many go a year or even more without producing a calf.

Bulls and breeding: As the Khomarikhel do not keep a bull themselves they must take the cows to nearby settlements to be served. For this they have to pay 100–200 Afs (US\$1–2). Settled farmers are not usually charged, which reflects the prejudice that exists between the settled villagers and *kuchi*.

Small ruminants: sheep and goats

According to the Panj Pai group, the twenty families own a total of about 600 head of breeding sheep and goats, of which about 400 are sheep and 200 are goats. Every family has some animals and ownership varies from 10–200. They keep two breeds of sheep which are managed separately for breeding purposes and are not crossed. Both are fat tails. One is a larger light brown “Arab”-type sheep valued for its size and meat quality. Its wool quantity and quality is poor. The other type of sheep is the smaller “*Ghilji*”, which produces a heavier fleece and better wool quality. The goats are the common black goats of the country.

Before the drought the Panj Pai group claims to have owned 2,000–3,000 animals. The drought (1998–2003) severely affected them and they were forced to sell the surplus animals they could not feed. Conditions improved in 2003, and by 2004 their flock had increased to about 700 head. In spring 2005, despite the much improved grazing, disease struck – lambs died and the flock was reduced to 600 breeding animals.

Daily seasonal management, herding and feeding

Winter camp daily grazing and feeding management: While camped in Panj Pai the total flock is divided into smaller daily grazing groups of 30–70 animals, and fifteen members of the group act as shepherds. This can be explained by the poor quality of the grazing and the need to graze in smaller groups.⁶⁷ Normally with larger flocking, one or two shepherds would look after 200–300 animals along with one or two dogs to guard against strangers and wolves. When split into many small flocks, it is not possible for every shepherd to have a dog. With the exception of three households,

⁶⁶ Traditionally in Afghanistan the richer and more powerful *kuchi* clans have acted as major money lenders to the settled communities through which they pass. This has become less common since the drought, and does not seem apply in the case of the Panj Pai Khomari Khel.

⁶⁷ Under normal circumstances, a shepherd plus a couple of guard dogs can manage a flock of 200–300 sheep and goats without too much difficulty (using traditional methods of close shepherding).

who have fewer than 50 head, each family takes responsibility for herding their own animals. Young men from the household are appointed or take turns as shepherds. Three poor families with very few animals band together and take turns providing a shepherd. Three families have no young men available and so must hire shepherds – one is from outside the clan (from Ghazni), while the other two are from within the clan. These shepherds are paid 400 Afs per sheep/goat per year.

The sheep and goats are taken out to graze in the surrounding plains and mountains in the early morning, resting for an hour or two in the middle of the day and returning to camp in the evening where they are fed straw. Rice and wheat straw is transported by camel from the irrigated valley villages to their camps. Although rice straw is readily eaten by cattle, it is less palatable for sheep unless mixed with wheat or barley straw. Lucerne hay may be purchased, but this is costly and in short supply. Grain is also purchased from the settled villages, mainly maize and barley as well as cottonseed. This is fed to the ewes for the last three months before lambing – Jaddi, Dalw and Hut (22 December to 20 March). Whole grain is fed to sheep mixed with straw.

Spring, summer and autumn grazing and feeding regime: Once they start to move from Laghman to the Shamali in spring, supplementary feeding stops (except for particularly weak animals) and the flock becomes dependent on grazing areas. They travel in comparatively small groups for the sake of the grazing and ease of movement. Once they reach their destination, first in the Shamali and later in the Panjsher valley, they can combine to form larger flocks.

Rams and breeding: The rams are kept in camp, separate from the ewes until the time for breeding in mid Mizan (early October) when they have returned to the Shamali from the Panjsher. The same applies to goats. The rams and ewes run together until they return to their winter camps in Laghman. They state that one healthy two-year-old ram is enough to cover 100 ewes, but there are usually other rams of mixed ages as insurance. Breeding rams are well looked after and great care is taken in their selection.

Lambs are born in late Hut and early Hamal (late March) and are still small when the spring migration begins. Those not strong enough to walk must either be carried on the baggage animals or by pickup from camp to camp.⁶⁸ In a good year they expect about 80 percent lambing (survival to weaning), but in years of severe drought or outbreaks of disease, such as in 2005, this can be reduced to 20 percent or less.

Small ruminants: products

Milk products: Milking the ewes and goats starts within a few days of the lambs being born; thereafter the owners share the milk with the young animals. It is customary among the *kuchi* for both men and women to share the task of milking. The young animals remain in camp during the day while their mothers are taken out to graze. Lambs and kids are allowed to suckle in the morning and evening. The main products are yoghurt, buttermilk, ghee, a white-grey cheese and *qurut*. Cheese, ghee and *qurut* are sold if in surplus to family requirements. The early milk is favoured for making cheese. Production of the more saleable items takes place once they have established themselves in a fixed camp, either in the Shamali or the Panjsher. Butter and cheese is stored in goatskins for later use or sale. The main market for milk products is Kabul once they return to the Shamali from the Panjsher in autumn.

⁶⁸ This applies to those families with substantial numbers of animals.

Sale of sheep: Ram lambs surplus to breeding requirements are sold at 7–8 months once the Khomarikhel return to the Shamali in autumn and before they return to Laghman for winter. Caste ewes are sold at the same time. Only breeding animals are maintained through winter. As the ram lambs are sold young, they are not castrated. Prices vary considerably with the condition and size of different animals, 1,500–4,000 Afs (US\$31–\$83). The animals are sold in various livestock markets such as Charikar and Qara Bagh in the Shamali, and in Kabul itself. Sometimes the animals are taken to be sold in the bazaar in Ghazni. They walk the animals to the nearer markets, but for Ghazni they hire transport. Sometimes itinerant traders visit the camps to buy sheep.

Wool, goat hair and weaving: The sheep are shorn once a year in the month of Jawza (21 May to 21 June) when they are still in the Shamali and before they leave for Panjsher. Wool surplus to domestic requirements is sold in the Pul-i-Kheshti bazaar in Kabul. Although some wool is retained for making felt rugs for their tents, they have no tradition of carpet weaving. There are two qualities of wool. The “Arab” sheep have only light fleeces and the poorer quality wool which only fetches 50 Afs per *man* (7 kg) (US\$0.15 per kg). The *Ghilji* sheep, although smaller-framed, carry a heavier fleece which is considered better quality and fetches 150–200 Afs per *man* (US\$0.45–\$0.60 per kg) depending on the colour. Goat hair is hardly used at all these days except for making ropes and bindings. The Khomarikhel are currently living in UNHCR-type tents. Drought led to a shortage of goat hair, but they believe that their old black goat hair tents were more spacious and comfortable, and they are thinking of reviving their previous skills in weaving goat hair tents.

8. Discussion

8.1 Livestock husbandry and integration with farming systems

Livestock are often considered separately from crops, however the two components of farming systems are integrated, and there is a strong symbiosis between them. This divide is further reinforced by the institutional separation between technical education and administration. There is little practical co-ordination or working dialogue between departments responsible for crop husbandry and protection, and livestock husbandry and animal health. This divide is also reflected in the way policy is written. A similar general demarcation exists between irrigation and crop husbandry. These divisions are purely institutional and do not exist in the perception of farmers who view their rural livelihood options holistically. For them, their livestock, crops, orchards, irrigation and grazing areas are all components of one integrated system.

As the livestock profiles of sixteen villages from four provinces in Afghanistan clearly show, ownership of both large and small ruminants is highly integrated with, and dependent on, the cropping systems practised in each case. Among the settled villages, livestock ownership is highly dependent on access to land, crops, forages, hays and straws. If a household does not actually own land, it must at least have long-term security of tenure as a tenant or valued sharecropper in order to invest in perennial crops such as lucerne or orchards. Short-term tenancy or sharecropping arrangements may be adequate for all types of annual crop, including fodder.

The feeding of both large and small ruminants for at least part of the year is usually dependent on food grain production. Nothing is wasted – crop residues and stubble, even weeds, fallen leaves and dried forage collected from the mountainsides. While crop residues such as wheat straw provide the bulk of winter feed for both large and small ruminants, fodder crops such as clover, lucerne and a range of pulses and legumes, some well adapted to harsh conditions, are an essential part of many farming systems.

These crops are grown in rotations on which the health of the land depends, assisted also by the use of farm yard manure when it is available. As an example, lucerne, which as a perennial fodder crop is maintained for five or six or even more years, is often (although certainly not invariably) cultivated between rows of fruit trees – at least until shaded out by the canopy. This both ensures it regular irrigation as well as helping to fix nitrogen for the orchard crop. Clover and pulses are cultivated in rotation with grain crops and farm yard manure, as well as the refuse from household middens, is used to fertilise certain crops such as potatoes and fruit trees. Dung also provides fuel for heating and cooking.

Sometimes owners of livestock are compelled to buy feed from elsewhere, and this study noted that a few better-off villagers in Zala Qala and Pyada Rah in Ghazni would buy some additional wheat straw from rainfed farmers in Nawur district to tide them over the winter. In most villages the better off buy a little cottonseed cake from the local bazaar from time to time. But for the most part, settled farmers and livestock owners maintain their animals from what they are able to produce themselves and from local grazing. If water for irrigation diminishes as the result of drought or problems with the system, this will have a direct effect on the number of small and large ruminants that can be maintained.

Although irrigated farming provides a more stable basis for grain and feed production, rainfed farming also supports livestock – although this is particularly vulnerable

to drought. Even in years of good precipitation, if rainfed wheat crops are destroyed by insect pests such as locusts or sunnpest, this has a direct impact on a location's carrying capacity for livestock. After a drought has ended, the recovery of livestock numbers takes longer than the recovery of crops on which they depend, and this can be further slowed by outbreaks of disease, as was the case in the spring of 2005 in many areas.

Ownership of small ruminants in particular depends on maintaining a balance between access to crop land and to common grazing areas. The verges of irrigated fields are grazed by cattle as well as sheep and goats, and stubble and crop residues are open to all the community's stock, large and small, once crops have been harvested and before the land is cultivated again. In the harsh environments of the high mountain valleys, even the coarsest of wild plants are gathered with considerable labour to maintain animals through winter.

Livestock ownership and cropping are integrated activities even for nomads such as the Khomarikhel *kuchi*, whose flocks could not survive on the poor winter grazing in the Laghman *dasht* if they could not afford to also buy wheat and rice straw, grain and cottonseed cake from neighbouring farmers. In other instances, although this does not apply to the Khomarikhel, nomads may rent seasonal stubble and residues from farmers who do not require it for their own livestock.

In Afghanistan the highly integrated and symbiotic nature of settled livestock ownership and husbandry must be understood in terms of its relationship to the cropping system with which it is associated. Unfortunately issues related to crop and animal husbandry are usually addressed independently from each other both in policy and institutionally. It is essential that this gap is effectively bridged and that the position of livestock husbandry as an integral component of farming systems is better understood and reflected in policy.

8.2 Livestock and rural livelihoods

In Afghanistan, livestock makes a very significant contribution to rural livelihoods by providing a source of protein and fibre to households with access to crop land. They also provide income for those households (usually a minority in any community) who own sufficient animals to produce a surplus to domestic requirements. For those who own cattle and sheep, their animals constitute a movable asset where few alternatives exist, and in times of need and crisis they can be turned into cash. Livestock have the added advantage of being able to reproduce themselves and may be replaced when the situation improves – through natural herd growth or from purchases. As this study observed, ownership of livestock by settled villagers is only really possible for those who have some access to crop land. Periurban communities with easy access to urban markets for dairy and poultry products may be an exception to this, where a greater dependency on purchased feed may be more cost effective.⁶⁹

Oxen provide draught power, but not all families can afford to maintain a pair or even a single ox throughout the year. Increasingly farmers are finding it more cost effective to hire a tractor for cultivation and threshing. Ownership of poultry or a donkey is not so dependent on access to land and these also make a valuable con-

⁶⁹ Only one case of milk cows being kept for commercial milk production was encountered – in Qala-i-Naw, Ghazni – where it also appeared worthwhile for some farmers to fatten bought-in lambs for the urban market.

tribution to the livelihoods of the poor.⁷⁰ While tractors and pickups are increasingly used for rural transportation, the donkey still plays an essential role and it is notable that although numbers of ruminants declined dramatically during the years of drought, numbers of donkeys are believed to have increased.⁷¹

Cows are mainly kept to meet household needs for milk products rather than for commercial production, unless proximity to an urban market makes the ownership of milk cows a viable option. In only a few villages are a majority of households able to maintain a cow and her offspring, and these are generally the better-off households. Even then it is usually based on a low-input, low-output form of production system.

Table 2. Feed base for large and small ruminants

Location	Home-grown straw and crop residue	Home-grown lucerne, hay	Home-grown green forage (clover, vetch, green maize and barley)	Home-grown grain (maize, barley, pulses)	Weeds and wild plants	Bought-in fodder (straw, hay)	Bought-in feed (maize, barley, cottonseed)	Grazing fringes of cultivation, stubble	Summer grazing on rangeland
Ghazni: Khwaja Umari district									
Zala Qala	Yes	Yes	Yes	Yes, pulses	Yes	A little	V. little	Yes	Yes
Pyada Rah	Yes	Yes	Yes	Yes, pulses	Yes	A little	V. little	Yes	Yes
Chel Gunbad	Yes	Yes	Yes	V. little	Yes	No	V. little	Yes	Yes
Turmai	Yes	Yes	Yes	V. little	Yes	No	V. little	Yes	V. little
Qala-i-Naw	Yes	Yes	Yes		Yes	A little	V. little	Yes	V. little
Kunduz: Khanabad district									
Alam Bai	Yes			V. little	Yes	No	None	Yes	Yes
Kunduz: Qala-i-Zal district									
Afghan Mazar	Yes	Yes	Yes	V. little	Yes	No	V. little	Yes	V. little
Dana Haji	Yes	Yes	Yes	V. little	Yes	No	V. little	Yes	V. little
Herat: Robat-i-Sangi district									
Khalifa Rahmat	Yes	Yes	Yes	V. little	Yes	No	V. little	Yes	Yes
Herat: Pashtun Zarghun district									
Tunyan Mian Deh	Yes	Yes	Yes	V. little	Yes	No	V. little	Yes	V. little
Ghorak	Yes	No	Yes	Yes (pulses)	Yes	No	None	Yes	Yes
Nangarhar: Achin district									
Khawaji	Yes	V. little	Yes	None	Yes	No	None	Yes	Yes
Otarkhel	Yes	V. little	Yes	None	Yes	No	None	Yes	Yes
Sra Qala	Yes	V. little	Yes	None	Yes	No	None	Yes	V. little
Maruf China	Yes	V. little	Yes	None	Yes	No	None	Yes	Access limited
Nangarhar: Batikot district									
Janikhel	Yes	Yes	Yes	Yes	Yes	No	Some	Yes	No
Laghman									
Khomarikhel <i>kuchi</i>	No	No	No	No	No	Yes	A little	No	Yes

While helping to meet household needs, sheep and goats also provide a source of income for some from the sale of milk products, live animals for slaughter and wool.

⁷⁰ In the settled situation, the ownership of horses or camels is generally the preserve of the better off, as they are more costly to maintain. Horses also often carry with them an element of prestige, especially in northern Afghanistan if they are kept for playing buzkashi.

⁷¹ Although no precise figures are available, this has been indicated by FAO, *Livestock Census*.

However this is usually only the case with a minority of households in most rural communities, even among those with access to grazing areas. Livestock also produce dung that is used for fuel and without it many families would not have any source of heat. Surplus dung is also used as manure for crops and fruit trees.

The situation of the *kuchi* is different from that of the settled villagers. Their traditional lifestyle and livelihood is still based on a pastoral economy, which involves the ownership of flocks and the ability to move seasonally between different grazing areas, at different altitudes, often over considerable distances. For *kuchi*, sheep and goats are the primary livelihood asset, not only for subsistence but also as the main source of wealth and income. Loss of animals can lead to destitution, particularly when the loss is wholesale and affects the whole group rather than individual families who, in times of difficulty, can rely on the better-off members of the clan for support.

The relationship between the *kuchi* and the settled population has never been an easy one, and yet they are, to an extent, dependent on each other. Politics, conflict and drought have all adversely affected the traditional nomadic life in recent years. As is becoming increasingly common, *kuchi* families with sufficient family members and fewer animals are often compelled to send these men away to earn a living from seasonal off-farm labour, either in Afghanistan or abroad. This is the case with the Khomarikhel.

The *kuchi* have traditionally supplied the urban population with most of its requirements for meat and milk products, as well as replacement stock for the settled population. In turn the *kuchi* need the fodder and grain of the settled farmers sustain their livestock through the winter.

As this study of sixteen village situations indicates, rural livelihoods in Afghanistan are based on a complex range of factors of which crop production and livestock husbandry, although important, are only a part.

8.3 Livestock and the role of women

Women play a significant role in caring for livestock of all kinds. They perform many tasks of vital importance, such as feeding animals when they are housed, cutting forage and fodder, collecting weeds, caring for sick animals, assisting with births, tending young animals, milking as well as preparing a range of milk products, drying meat for the winter, washing, carding and spinning wool, knitting, needlework, making carpets, kilims and felts, as well as making the dung pats which are used as fuel. Women are responsible for managing the household poultry; this was well illustrated in some of the Herat villages where small groups of women band together to organise the brooding of eggs and raising chicks.

Kuchi of all ages and both sexes play vital roles within the camp and on migration. The independent demeanour of *kuchi* women, leading a train of camels while migrating, is a legendary feature of the traditional Afghan scene, and it is notable that in *kuchi* culture both men and women share the responsibility of milking, as illustrated by the Khomarikhel.

8.4 Comparisons of livestock management

Certain features of traditional livestock husbandry are broadly similar throughout the country but in different circumstances, while others are more location- and situation-specific. The relationship between livestock ownership and the different

types of land tenure (land owner, tenant and sharecropper) has been noted, but apart from access to land, there are some significant differences between the management and ownership of large and small ruminants.

Large ruminants

There is a remarkable similarity in the management of cattle, in particular cows, across the country in all of this study's primary research sites. Subsistence and household needs predominate rather than the maintenance of cattle for the commercial production of meat and milk. However in some situations there are variations to this pattern, particularly in certain periurban locations such as Qala-i-Naw where some families produce milk for the Ghazni urban market. The more typical situation is a household with secure access to crop land possessing one or possibly two cows plus their young stock, managed and herded by the owners and never moving very far from the owner's house or crop land. Only in two cases (Alam Bai in Kunduz and Janikhel in Nangarhar) did slightly more than half of the village households own at least one milk cow plus her progeny.

Where a community owns sufficient cattle, households may combine to employ a community herder to herd the cattle during the day, which return to their respective owners' houses in the evening. Cattle are stall fed at night and during cold or inclement weather. The basis of feed is green forage (when available) in season, weeds, straw, hay and stubble grazing in season. Wheat straw makes up the bulk of the winter feed.⁷² Supplementary feed such as cottonseed cake may be fed, but this is done sparingly and only when considered absolutely necessary. Production levels are low, with heifers usually giving birth in their third year and thereafter the interval between calving is commonly well over twelve months. Lactations generally last between 6 and 9 months, sometimes longer.

Few villagers can afford to maintain a bull for breeding and there is little financial incentive to do so. Custom does not encourage the owner of a bull to charge a service fee. Out of the sixteen communities visited, eight did not have a bull, and of those that had a bull, all but two communities complained that it was either immature or of inferior quality. In the few instances where there has been experience of an AI programme, it has not proved satisfactory.⁷³

The productivity of cows in Afghanistan could be increased by introducing a number of simple improvements in health care, hygiene and improved feeding and breeding, but care will always need to be taken to ensure that villagers understand and accept that the additional cost of such improvements will be more than covered by the additional benefits. The current management system is based on low input, low output, and while a subsistence psychology persists there are few incentives to increase production if it entails additional costs.

The study indicated a general increase in the reliance on tractors for cultivation and threshing, even if it means hiring a tractor from a neighbouring village. Although one or two pairs of oxen can still be found working in most villages, fewer families than before are reliant solely on oxen. Indeed in only one village (Alam Bai in Kunduz) were oxen found to still be the predominant source of draught power, and this was only because much of the rainfed crop land is too steep for tractor cultivation.

⁷² In rice-growing areas, this may also include rice straw (as in Laghman). What about rice-growing areas in Kunduz Province?

⁷³ For example, in Maruf China village cows had died when calving as the result of being inseminated with semen obtained from large breeds of cattle.

These figures must be taken as approximate estimates provided by village elders after discussion and cannot be taken as precise data.

*Table 3. Cattle management systems*⁷⁴

Location	Number of bulls*	Number of oxen	Tractor power**	Individual household herding	Village cowherd	Percentage of households owning cows***	Commercial milk production (in addition to household use)
Ghazni: Khwaja Umari district							
Zala Qala	1	0	Yes	Yes	No	Very few	No
Pyada Rah	3*	1	Yes	Yes	No	25%	No
Chel Gunbad	1*	1	Yes		Yes (both sheep and cattle)	25%	No
Turmai	0	1 or 2	Yes	Yes	No	30%	No
Qala-i-Naw	3*	0	Yes	Yes	No	50%	Yes
Kunduz: Khanabad district							
Alam Bai	0	6	No	Yes	No	58%	No
Kunduz: Qala-i-Zal district							
Afghan Mazar	0	"Many"	Yes	Yes	No	50%	No
Dana Haji	0	1	Yes	Yes	No	10–12%	No
Herat: Robot-i-Sangi district							
Khalifa Rahmat	1	3	Yes		Yes	50%	No
Herat: Pashtun Zarghun district							
Tunyan Mian Deh	2–3*	4	Yes		Yes	50%	No
Ghorak	0	0			No	None	No
Nangarhar: Achin district							
Khawaji	0	1	Yes	Yes	No	10%	No
Otarkhel	1	1	Yes	Yes	No	25%	No
Sra Qala	0	0	Yes	Yes	No	8%	No
Maruf China	0	0	Yes	Yes	No	30%	No
Nangarhar: Batikot district							
Janikhel	3–4*			Yes	No	50%–60%	No
Laghman							
Khomarikhel <i>kuchi</i>	0	No cultivation	No land	Both individual and group	Not specific to cows	50%	No

* Young/immature and/or poor quality bull(s), in the estimation of the village elders.

** Tractor power for cultivation and threshing significant even when this necessitates hiring from a neighbouring village.

*** Approximate percentages given by community elders for households (as opposed to individual families) owning at least one family cow plus follower(s).

Small ruminants

As with cattle, the management of small ruminants is based on low-cost input, although farmers report that the potential return on investment tends to be higher with sheep than with cattle. Whether or not a shepherd is hired by the community usually depends on the total number of sheep and goats owned by the community, or sometimes by neighbouring settlements in a single *manteqa*. It also depends on having access to grazing areas. The management of small ruminants depends to a greater extent than the management of cattle on maintaining a balance between grazing areas and the production of straw and crop residues, and the cultivation of

⁷⁴ Numbers and percentages are as given by village elders, and are not confirmed data.

fodder crops and some grain – for which access to crop land is necessary. Location, altitude, local variations in climate and season, access to the products of irrigated and rainfed arable farming, and the nature of the grazing areas are all factors that influence decisions and variations in seasonal management. Other factors include:

- whether or not the community makes seasonal use of different sections of their rangeland (transhumance);
- the number of months the animals are stall fed through the winter;
- the quality and nature of the forage and fodder;
- flock size;
- how shepherds are paid;
- whether or not the animals return to their individual owners' homes each evening or remain out with the shepherd at night;
- the age and season when surplus males and old females are sold or slaughtered; and
- whether or not males which are not required for breeding are castrated.

Management decisions are also influenced by the availability of feed and the perceived degree of risk in maintaining animals longer in order to achieve greater size and weight and therefore a better potential sale price. Fewer small ruminants tend to be kept where communities have little or no access to grazing areas, and then they are usually managed on an individual household basis similar to the house cow.

Table 4. Small ruminants management systems

Location	Households owning small ruminants* (approx.)	Irrigated land	Rainfed land	Rangeland grazing	Shepherd	Trans-humance	Some commercial surplus**
Ghazni: Khwaja Umari district							
Zala Qala	98%	Yes	Yes	Yes	Yes	No	Limited
Pyada Rah	95%	Yes	Yes	Yes	Yes	No	Limited
Chel Gunbad	50%	Yes	Yes	Yes	Yes	No	V. limited
Turmai	50%	Yes	No	V. little	No	No	No
Qala-i-Naw	Very few breeding animals	Yes	No	V. little	No	No	Lambs bought in to fatten
Kunduz: Khanabad district							
Alam Bai	Very few ***	No	Yes	Yes	Not at present	No	None ***
Kunduz: Qala-i-Zal District							
Afghan Mazar	Very few	Yes	No	Limited access	For 3 families	No	None
Dana Haji	Very few	Yes	No	Limited access	No	No	No, but 1 household has 100 sheep
Herat: Robot-i-Sangi district							
Khalifa Rahmat	30–35%	Yes	Yes	Yes	Yes	Yes	Limited
Herat: Pashtun Zargun district							
Tunyan Mian Deh	50–55%	Yes	No	No	Yes		V. limited
Ghorak	100% goats only	Yes	Yes	Yes	Yes	Yes	Only 2 households with surplus

Nangarhar: Achin district							
Khawaji	No more than 35%	Yes	Yes	Yes	Yes	No	None***
Otarkhel	30–35%	Yes	Yes	Yes	Yes	No	None***
Sra Qala	Very few	Yes	No	V. little	No		None
Maruf China	Very few	Yes	No	V. little	No		None
Nangarhar: Batikot district							
Janikhel	50–60%	Yes	No	No	No		V. limited
Laghman							
Khomarikhel <i>kuchi</i>	100%	No	No	Seasonal migration	Yes	Yes	Pastoral economy

* Information as provided by elders on households owning sheep and goats.

** Means that some households have enough sheep and goats to have a regular surplus of animals, milk products or wool to sell. This is very difficult to quantify as numbers of animals must be balanced against numbers of members of a household, and these precise figures were not collected.

*** Disease appears to be a particularly serious factor in limiting flock increase.

Feed and fodder

By-products of the staple crops (wheat, maize, rice and pulses) make up the bulk of the winter feed in the form of straw and stover for both sheep and cattle. If available, and only when needed, some better quality lucerne hay (supplemented with milled barley or maize grain and pulses) is also used. Because of the generally limited and fragmented nature of land holdings, the balancing the area of food grains cultivated as well as other crops including fodder crops and pulses is a delicate one.

In some cases improvements in the efficiency of an irrigation system or the management of irrigation water may help to increase the area of cultivation, but this opportunity is not available to all. There may be a possibility of increasing the yield per unit of land of both grain and fodder crops, but to increase the acreage of one crop at the expense of another may be more difficult unless one crop has some obvious economic advantage over the others. The crops and the cropping systems practised have often been developed over many generations to fit the particular environmental circumstances of the location. This may be in direct response to a harsh environment, as is demonstrated in the cases of Zala Qala and Pyada Rah in Ghazni and Ghorak in Herat where particular drought-tolerant legumes and pulses are traditionally cultivated. On the rainfed and drought-prone lands of Ghazni, Herat and Kunduz, crops that suit the environment are traditionally cultivated, and these also make up the basis of livestock feed and fodder. Far from being primitive, some of these cropping systems are highly sophisticated and warrant much closer study for the lessons they may have to teach. Before making recommendations for improvements, it is necessary to better understand the survival systems already being practised.

In general throughout Afghanistan, with some possible exceptions, where a village has access to grazing areas this is the common right of all livestock-owning members of that community. Stubble and crop residues are also generally open to all in the community for the period between the clearing of the harvest and the subsequent cultivation.

The case of the Khomarikhel *kuchi* is different from that of the settled livestock owners, as livestock ownership and management systems are dependent on being able to move between different seasonal grazing areas over long distances, between their summer pastures in the Panjsher valley and their winter camps in Laghman. They are nonetheless dependent on having access in the winter to fodder and grain

produced by settled farmers in Laghman. In some locations stubble grazing may be leased to *kuchi* by settled farmers, although this does not apply to this group of Khomarikhel wintering in Laghman.

Wool and carpet making

Table 5. Uses of wool and hair

Location	Locally produced wool and hair sold	Local wool used for general domestic purposes*	Local wool used for commercial weaving	Commercial carpet weaving but wool supplied by traders
Ghazni: Khwaja Umari district				
Zala Qala	Yes	Yes	No	No
Pyada Rah	No	Yes	Yes	No
Chel Gunbad	No	Yes	Formerly, not now	No
Turmai	No	Yes, few sheep	No	No
Qala-i-Naw	No	Yes, few sheep	No	No
Kunduz: Khanabad district				
Alam Bai	No	Yes, few sheep	No	No
Kunduz: Qala-i-Zal district				
Afghan Mazar	No	Yes, few sheep	No	Yes
Dana Haji	No	Yes, few sheep	No	Yes
Herat: Robot-i-Sangi district				
Khalifa Rahmat	No	Yes + tents	Yes	Yes
Herat: Pashtun Zargun district				
Tunyan Mian Deh	No	Yes	No	Yes
Ghorak	Yes cashmere	Yes + tents	No	No
Nangarhar: Achin district				
Khawaji	No	Yes	No	No
Otarkhel	No	Yes	No	No
Sra Qala	No	Yes, few sheep	No	No
Maruf China	No	Yes, few sheep	No	No
Nangarhar: Batikot district				
Janikhel	No	Yes, few sheep	No	No
Laghman				
Khomarikhel <i>kuchi</i>	Yes	Yes	No	No

* Knitted garments, saddle bags, felts, stuffing mattresses etc.

In most villages where sheep and goats are raised, wool and goat hair is used for a number of household purposes, even if not as a commercial activity. It is common for village women to wash, card and spin wool, and knit socks and gloves or make tent cloth (for example in Khalifa Rahmat and Ghorak). In other villages, even those with reasonable numbers of sheep such as Zala Qala in Ghazni, carpet making is not a well-established tradition and surplus fleeces are sold. However, in several of the primary research sites the manufacture of carpets and rugs of different kinds is an important economic activity. In several instances carpets are manufactured on contract to traders. Interestingly, carpet making is not necessarily dependent on the ownership of sheep, although the skills may be historically associated with a previous pastoral life. An extreme example of this is the Turkman villages of Qala-i-Zal in Kunduz, where few families own sheep but many households produce carpets made by the women on contract to traders based in Pakistan who provide credit, wool and other necessary materials. Carpet making on contract to Herat traders is an important economic activity in the cases of Khalifa Rahmat and Ghorak in Pashtun Zargun, and is also not entirely dependent on locally produced wool.

8.5 Constraints on management: perceived problems

Discussion with farmers suggests that ownership of both large and small ruminants is largely dependent on assured access to crop land. However, the actual breakdown in each community between different types of households owning different numbers and types of livestock (that is, landowners and different categories of tenants and sharecroppers) needs further study. It is clear at this stage that households without access to crop land are seriously impeded from owning livestock, with the possible exception of poultry and a donkey. The exception may be periurban situations with particularly good access to urban markets, where dependence on bought-in feed may be economically justified. Bearing this in mind, the primary problems, concerns and constraints perceived by rural livestock owners are as follows.

Disease and the lack of an effective or competent veterinary and vaccination service was a universal complaint in every community – even in those cases where a VFU was reported to be present in the provincial or district centre (as was the case in Ghazni, Herat, Nangarhar and Laghman). In several instances it was clear that the post-drought or post-conflict flock recovery was hampered by excessive losses due to disease, and that it could have been materially enhanced by an effective animal health programme. In general this was a problem in all research sites, but it was particularly serious in Alam Bai in Kunduz and the Achin villages in Nangarhar. The absence of a nationwide and effective veterinary programme has almost certainly delayed the post-drought recovery of the national flock. Disease has probably affected small ruminants more than large ruminants (where losses appear to be less), but no reliable data exists.

Drought and its adverse effects on crop, fodder production and pastures was in all sites referred to as a serious constraint, the severity of which depending on the location and access to perennial water. Anxiety relating to drought and its recurrence was most acute in villages where the source of water was insecure, as in the springline villages of Ghazni, the rainfed villages of Khanabad in Kunduz, the upland villages of Robat-i-Sangi, and the springline villages of Pashtun Zarghun in Herat and Achin in Nangarhar – and also in general by the Khomarikhel *kuchi*. But even in those villages with better access to perennial irrigation water, such as riverine villages, problems with irrigation water and consequently with crop and fodder production were cited. In the case of Ghazni the collapse of the Band-i-Sultan dam in the early spring of 2005 and current delays in the completion of repair work are causing problems.

Crop damage by insects: As straw makes up the bulk of fodder for both large and small ruminants, the wheat crop is seen as having a dual purpose – to sustain both humans and animals. Particularly in the north and northeast of Afghanistan (where there is a dependence on rainfed crops), locusts are a constant threat and concern. This pest has been efficiently controlled over the last three years, but the continuation of an effective control programme is dependent on the timely provision of international assistance on an annual basis. Among the primary research sites, those places most vulnerable include the Mia Ali villages in Khanabad, Kunduz. Sunnpest is a serious problem in the northwestern provinces, including Herat, Badghis and Faryab in particular. Not only is the grain spoiled, but the straw is reduced in quality and without the grain there is less economic incentive to reap it. Control of sunnpest has not been as effective as it has been for locusts.

Serious conflict over grazing and pasture land was only reported in the Ghazni springline villages and to some extent from Chel Gunbad on the upper Ghazni River.

Elsewhere the rights of passage for migrating *kuchi* seem to be respected by both the settled villagers and the *kuchi*, even if there have been problems in the past as in Ghazni under the Taliban regime. Traditional social mechanisms appear to exist in most places to guard the integrity of grazing land or to solve potential problems.

Table 6. Farmer-reported serious problems and constraints to livestock husbandry

Location	Access to crop land necessary for ownership	Drought	Irrigation water	Access to drinking water for livestock	Winter fodder	No effective vet or government service	Live-stock disease	Insect pests	Absence or lack of good bull	Conflict over grazing or with <i>kuchi</i>
Ghazni										
Zala Qala	Yes	Yes	Yes	No	Yes	Yes	Yes	No	None	No
Pyada Rah	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Poor quality	Yes
Chel Gunbad	Yes	Problem with dam	Problem with dam	No	Yes	Yes	Yes	For fruit trees	Poor quality	Yes
Turmai	Yes	Problem with dam	Problem with dam	No	Yes	Yes	Yes	For fruit	None	In the past
Qala-i-Naw	Yes	Problem with dam	Problem with dam	No	Yes	Yes (+ AI)	Yes	For fruit	Poor quality	In the past
Kunduz										
Alam Bai	Yes	Yes	*No irrigation	Yes	Yes	Yes	Yes	Yes***	None	No
Afghan Mazar	Yes	No	Yes	No	Few stock	Yes	Yes	No	None	No
Dana Haji	Yes	No	Yes		Few stock	Yes	Yes	No	None	No
Herat										
Khalifa Rahmat	Yes	Yes	Yes		Yes	Yes	Yes	Yes***	1 good bull	No
Tunyan	Yes	Yes	Yes		Yes	Yes	Yes	No	Poor quality	No
Ghorak	Yes	Yes	Yes		Yes	Yes	Yes	No	No cows	No
Nangarhar										
Khawaji	Yes				Yes	Yes	Yes	No	None	No
Otarkhel	Yes				Yes	Yes	Yes	No	1 good bull	No
Sra Qala	Yes	Yes	Yes	Yes	Few stock	Yes	Yes	No	None	No
Maruf China	Yes	Yes	Yes	Yes	Few stock	Yes	Yes	No	None	No
Janihhel	Yes		Yes			Yes (+ AI)	Yes	No	Poor quality	No
Laghman										
Khomari-khel <i>kuchi</i>	Ability to purchase fodder in winter necessary	Yes	**		Yes	Yes	Yes	No	None	Careful to avoid but no secure rights

* All rainfed and no access to irrigation water in Alam Bai.

** Khomarikhel *kuchi* have no access to crop land.

*** Alam Bai – Locusts; Khalifa Rahmat – Sunnpest.

Denial of access to cultivated land is perceived as a problem by the Khomarikhel *kuchi*, who admit to going to great lengths to avoid conflict with the settled people

along their migration route, but who are also seasonally dependent on buying fodder and grain from the settled Laghman farmers to tide them over the winter. Their lack of formal rights of tenure to their seasonal camping grounds, with the exception of their summer camps in Panjsher, make them particularly vulnerable and insecure.

Population pressure on limited land resources and the necessity for households to send men away to earn a living in Afghan cities or abroad was mentioned in all sites. Although this can be seen as a problem, earnings from off-farm labour also open up opportunities to diversify livelihood options. For instance, without the earnings from off-farm labour by some members of livestock-owning households in Zala Qala and Pyada Rah in Ghazni, they admit that they could not afford buy replacement stock for their flocks in the bazaar in Ghazni. In Nangarhar, particularly in Achin, the lack of alternative means of earning a living is often given as the main reason for migrating and for cultivating opium poppy. Livestock husbandry is not seen as a viable alternative. Elsewhere among the primary research sites, poppy cultivation was not considered a livelihood option, with the possible exception of the Turkmen villages of Qala-i-Zal to some extent, but this was primarily to feed an addiction to opium among the local villagers.

The general lack of government capacity to assist the livestock sector, both in terms of technical knowledge as well as logistical resources and manpower, was noted throughout this study. A cornerstone of the MAAHF *Master Plan* is stated as being the strengthening of this capacity, however there is little evidence of any tangible improvement as yet. Although villagers in all sites complained of a lack of government assistance, they have come to expect little, and are certainly not relying on it.

Other problems noted during the research include:

- lack of or absence of good bulls for breeding;⁷⁵
- ineffectiveness of, and dissatisfaction with, the AI service in the few places where this exists or has existed in the past;
- the generally poor level of nutrition for cattle, and the consequent low level of productivity. Small ruminants are generally able to make better use of rough grazing, forage and feeds; and
- poor winter housing may also be a problem, although it is not one which the average Afghan livestock owner would always recognise.

Drinking water for livestock was not mentioned as a serious issue, with the possible exception of Khanabad rainfed villages in the Mia Ali valley. In most communities there are reasonably accessible sources of drinking water for village livestock – at least in the mornings and evenings.

⁷⁵ Except, it seems, in the case of *kuchi*.

9. Conclusions: A Review of the Issues Summarised in the MAAHF *Master Plan*

The MAAHF *Master Plan* outlines in some detail what needs to be done to develop an effective combination of government and private sector service to improve the productivity of Afghanistan's livestock. The *Plan* stresses that its objectives are mostly long term, and it does not underestimate the difficulties of the task. The need for a better understanding of the ground realities affecting productivity is emphasised, in particular the need to foster consciousness of the uniqueness of different situations, the risks inherent in generalisations and the development of policies based on the perception that "one size fits all".

To follow are some comments on the problems highlighted in the *Master Plan*, in light of the results of this initial study of livestock husbandry in four primary research sites:

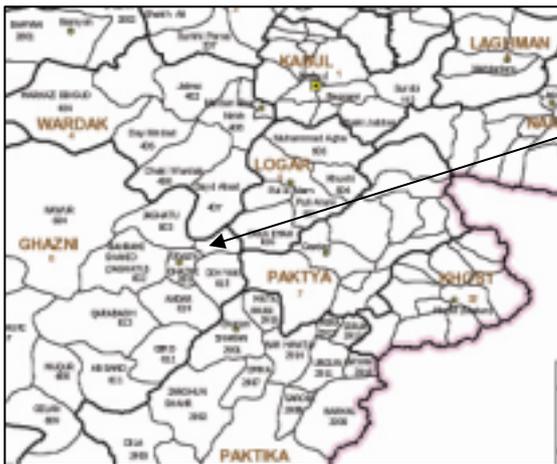
1. **The need to improve and redefine an effective government and private sector-led veterinary service.** Although animal health and veterinary services were not the focus of attention during field work, animal health and the lack of effective veterinary and vaccination services were emphasised by both the settled villagers as well as *kuchi* in all sites.
2. **Poor livestock management, housing and nutrition.** While recognising that there are shortcomings in the ways in which both large and small ruminants are presently managed, and that undoubtedly improvements could be made in the standard of housing and nutrition, it is also necessary to understand the constraints under which the owners of livestock must manage their animals. Taking into account the difficulties of the environment, the existing systems of livestock management and the farming systems that support livestock often demonstrate considerable skill and sophistication. Rather than "writing off" local management practices as backward and outdated, care must be taken to understand the reasons that have given rise to existing practices and credit given to their resilience in the face of a harsh environment.
3. **Periodic lack of pastures or feed linked to frequent droughts and insufficient availability of agricultural by-products which affects production and the growth of national herds.** The effects of drought were a matter of concern in all sites. While not being able to protect the rural population against the vagaries of climate, there are things which can be done to ameliorate the situation, such as improving the quality and possibly the quantity of forage and fodder, conservation of water resources and more efficient use of irrigation water. When introducing "improvements", however, care must be taken not to destroy existing traditional practices and survival mechanisms. For instance, the cultivation of drought-tolerant legumes and pulses should not be overlooked.
4. **Lack of marketing facilities and information, and 5. Inadequate organisation of processing and marketing of livestock products.** The villagers and livestock owners interviewed appeared to be well informed about local market opportunities and constraints, as well as current prices in their local markets for livestock and livestock products. They generally had quite well-developed systems of marketing their produce when in surplus, either doing this themselves or using local traders. Livestock owners may face

- a number of marketing constraints, such as shortage of cash and fodder, which compel them to sell animals prematurely at disadvantageous prices. With the price of meat and milk products currently high there were few complaints about prices. This is not to say that improvements are neither needed nor possible; some studies of livestock marketing have been initiated recently,⁷⁶ but this remains a subject that still requires more intensive investigation.
5. **Lack of clear and adapted extension messages or of a coherent extension organisation.** The study noted the absence of any effective extension activity with respect to livestock husbandry in the communities visited. The Department of Agriculture office in Ghazni claims to receive regular technical messages (in pamphlet form) from the MAAHF in Kabul, but their relevance to the reality of the situation in the villages is dubious, and no villager interviewed during the field work had seen them.
 6. **Inadequate information on, or access to, improved or good genetic material for upgrading indigenous livestock.** This is perceived to be a more serious issue with cattle than small ruminants. In many villages there is no bull at all, or only of inferior quality. Few villagers can afford to maintain a bull (nor, for that matter, a plough ox). These issues seem to be less of a concern with respect to small ruminants. There appears to be less care taken in the selection of breeding rams in villages where sheep are of less significance, while in those villages where sheep are significant considerable care is generally taken in the selection of breeding rams and of the breed itself. The general quality of sheep is certainly better than the general quality of cattle.
 7. **Lack of research initiatives on locally adapted livestock management practices.** Issues relating to livestock husbandry have not been studied in much detail in recent years in Afghanistan, and certainly not in combination with animal health issues. Of particular importance is a better understanding of how in the settled situation livestock husbandry, crop husbandry and farming systems are integrated. Even the *kuchi* pastoralists, in certain seasons and locations, are dependent on the settled farmers with whom they coexist and on urban consumers to provide a market in which they can sell meat, milk products and wool.
 8. **Lack of any coherent legislation on land and pasture rights and (potential and actual) conflict between *kuchi* and settled farmers.** There is a lack of coherent legislation on land and pasture rights, and in some places conflict between *kuchi* and settled farmers is a serious issue. However, in only two instances out of sixteen villages visited was this found to be a serious current issue – in Pyada Rah and Chel Gunbad. Stories of past difficulties with migrating *kuchi* were recounted in Chel Gunbad and Turmai in Ghazni and in Janikhel in Nangarhar in which *kuchi* had grazed livestock through the crops, but these were in the past and under different political circumstances. The Khomarikhel wintering in Laghman carefully avoid problems with the settled farmers, but complain of their lack of legal rights to their winter camping area on the Dasht-i-Panj Pai. When discussing issues relating to land tenure

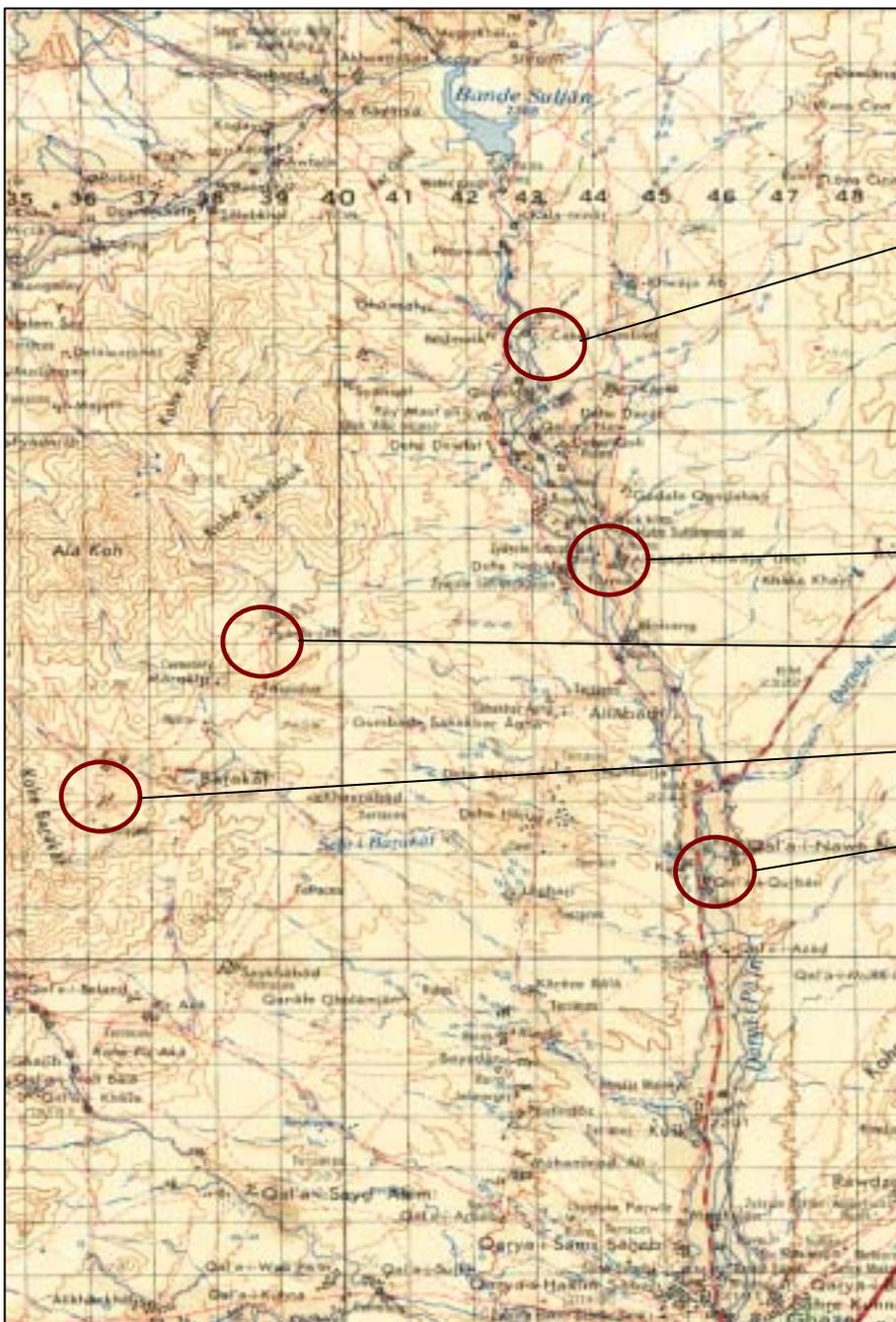
⁷⁶ See: E. Thomson, P. Chabot and I. Wright, 2005, *Production and Marketing of Red Meat, Wool, Skins and Hides in Afghanistan: A Case Study from Kabul, Kandahar and Kunduz Provinces*, Aberdeen and Kabu: Macaulay Institute and Mercy Corps.

and even irrigation disputes with villagers, the overwhelming response was that they only look to the government to settle such issues as a last resort, preferring traditional systems of conflict resolution. This is in part a reflection of how government is perceived, rather than the lack of a legal framework, and is not the same issue as the need to establish new legislation. However legislation in itself will be insufficient if the government as a trusted administrator of justice remains itself deeply mistrusted by the rural population.

Appendix 1: Maps of the Primary Research Sites



Ghazni Province:
Khwaja Umari District



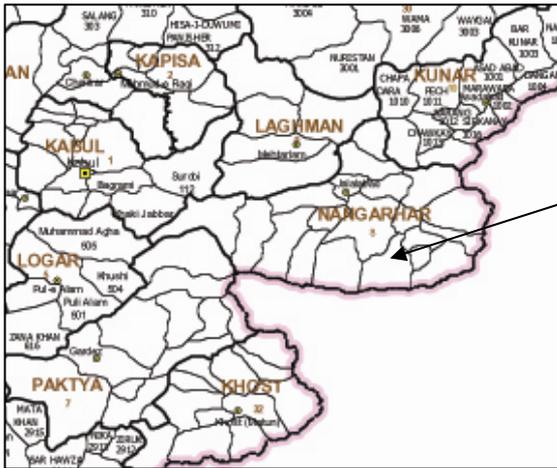
Chel Gunbad

Turmai

Pyada Rah

Zala Qala

Qala-i-Naw



Nangarhar Province:
Achin and Batikot Districts



Janikhel

Maruf China

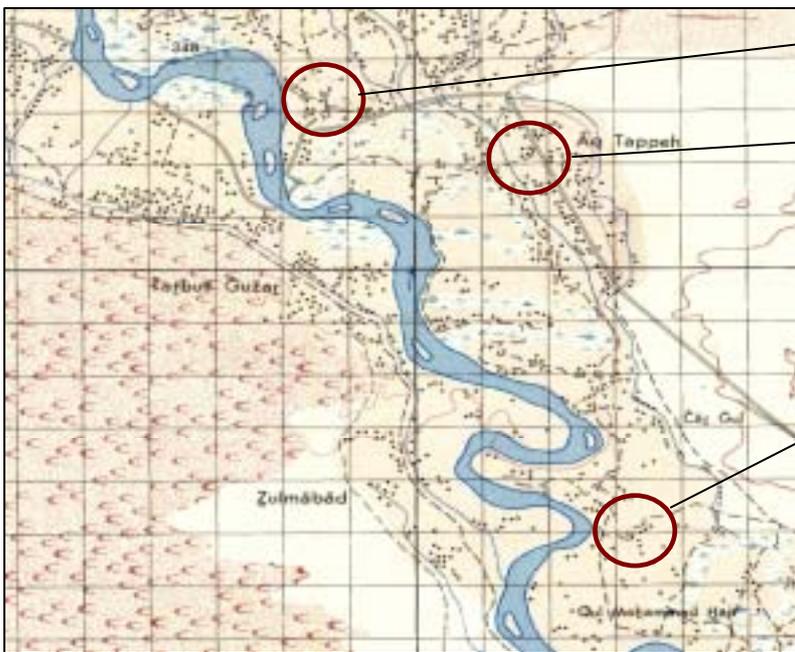
Sra Qala

Otarkhel

Khawaji



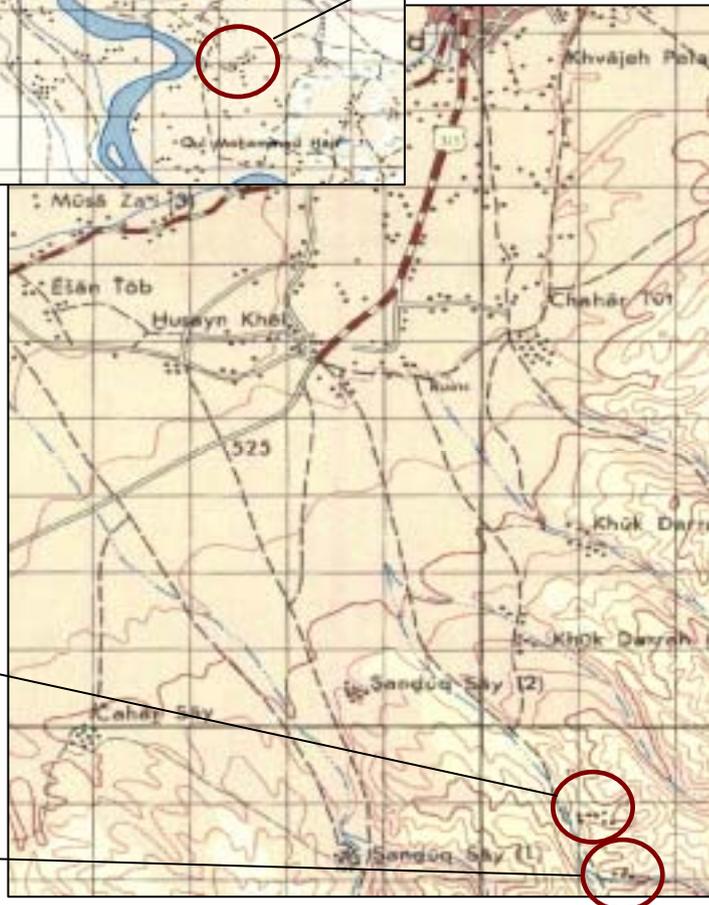
Kunduz Province:
Qala-i-Zal and Khanabad
Districts



Dana Haji

Afghan Mazar

Wakil Jangal

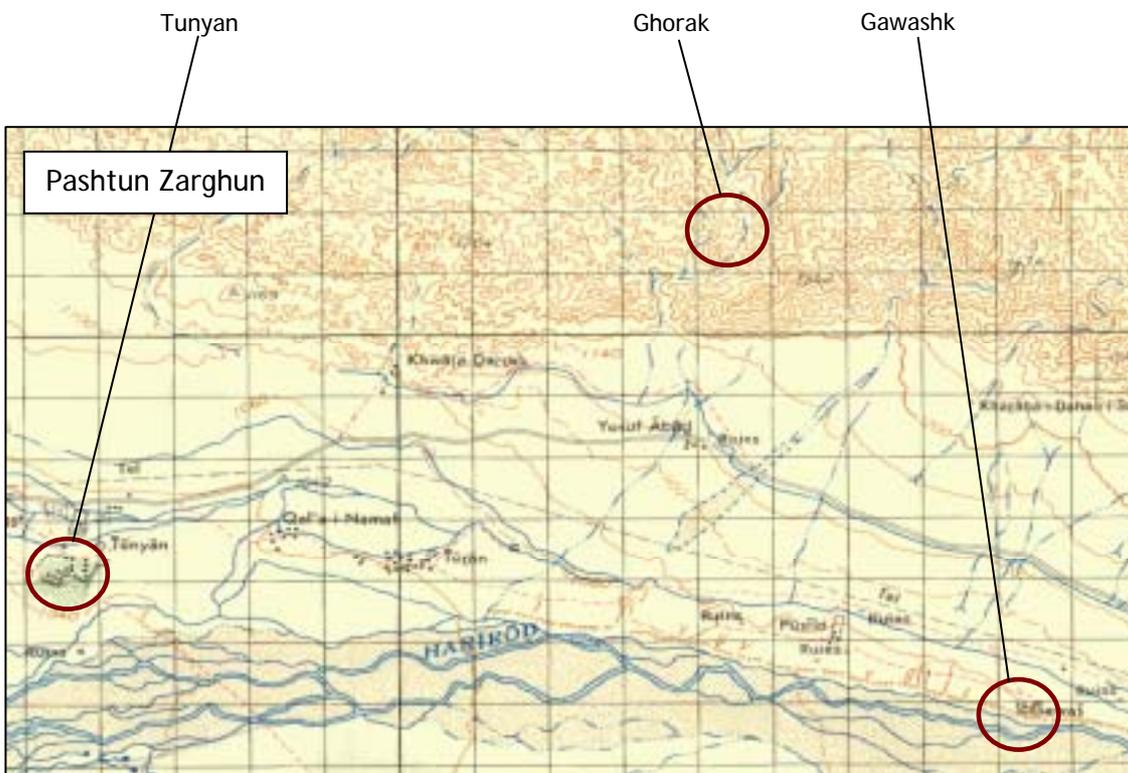


Abdul Nazar

Alam Bai



Herat Province:
Robot-i-Sangi and
Pashtun Zarghun Districts

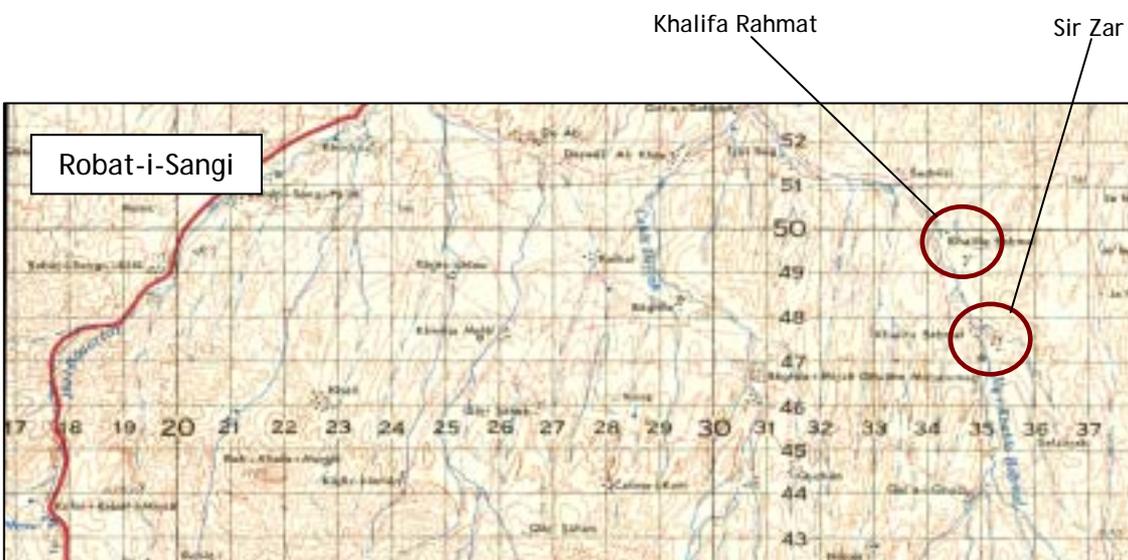


Tunyan

Ghorak

Gawashk

Pashtun Zarghun



Khalifa Rahmat

Sir Zar

Robot-i-Sangi

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), ***shombe/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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