YAK-KEEPING IN HIGH ASIA

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Introduction

Discussions of environmental changes in High Asia frequently put the main emphasis on ecological aspects. Besides their ecological quality natural resources, climatic constraints and surface conditions are important frame conditions for socio-cultural adaptation and economic activities in High Asia as well.

Thus let me draw attention to the overlap of ecology, culture and economy. In high mountain research we observe such mutual fields of interest when studying mixed mountain agriculture. The utilization of natural resources is especially reflected in the sectors of water use, forest exploitation and animal husbandry. Climatic constraints and cyclic changes in vegetation cover affect the seasonal patterns of human activities. These factors gain importance with altitude and limit the available space for agricultural undertakings. This last aspect will be highlighted in the following. Talking about yak-keeping I have chosen to focus on a species of domesticated animals which have the reputation of being only adapted to high altitudes and capable of enduring these harsh conditions.

Yak research in High Asia: concepts and topics

What is the role of yak (*Bos grunniens*) research in this context? In recent years more attention has been drawn to this sector and the majority of

research material stems from the People's Republic of China. This is quite understandable as China is the most important country with yak herds in sizeable numbers (Tab. 1). The high mountain regions and plateaus of Inner Asia are basically the major area of yak distribution as is emphasised in the recent monograph on the yak by Cai Li & Gerald Wiener (1995). This book and a number of articles listed therein give insight into breeding and

Tab. 1: Yak populations and their distribution in High Asia

Region	Yak numbers	Yak crosses	Area of distribution
Qinghai	4 500 000		Qinghai
Tibet (Xizang)	3 954 000		Tibetan Plateau
Sichuan	3 363 000		Western Plateau
Gansu	800 000		Qiliang Shan
Xinjiang	250 000		Tien Shan, Kun Lun Shan, Pamir
Yunnan	50 000		North-Western part
Inner Mongolia	2 000		Holan mountains
Mongolia	571 000	56 000	Altai, Chuwsguler Mountains, Changai
Kyrgyzstan	60 000		Alai, Tien Shan
Tajikistan	17 000		Pamir
CIS (except Tajikistan & Kyrgyzstan)	60 000		Caucasus, Altai, Tuva, Buryatia, Baikal
Afghanistan (Badakhshan-Pamir)	3 500		Hindukush, Pamir
Pakistan (Chitral)	5 000		Hindukush
Northern Areas	2 000	2 000	Karakoram
Jammu & Kashmir	13 000		Himalaya: Ladakh, Zanskar
India (Arunachal Pradesh, Sikkim, Himachal Pradesh, Uttar Pradesh)	17 000		Himalaya
Nepal	19 000	41 000	High Himalaya: Solu Khumbu
Bhutan	30 200		Himalaya

Sources: BARTHEL 1990: 120; CAI LI & G. WIENER 1995: 6; HASERODT 1989: 125; KREUTZMANN 1986; 1996; Land Use Planning Project Bhutan 1995; Nepal Central Bureau of Statistics 1991; PAL 1993: 64; SARBAGISHEV ET AL. 1989; SHAHRANI 1979a

crossbreeding, production and reproduction, adaptation to different environments and further aspects related to animal science.

From a cultural geographer's perspective I would like to draw attention to some other aspects related to yak-keeping in high altitude environments. First there is the question of the "nomadic alternative". This title was used by Thomas Barfield (1993) for a survey of nomadism. The term was coined by Bruce Chatwin (1970) who introduced it in an exhibition catalogue about the archaeology of nomadic art forms, and was later taken up by Wolfgang Weissleder (1978) who edited a volume on interaction modes and models in the nomadic sector of Africa and Asia.

The term "nomadic alternative" implies that there might be an option within the process of modernization for the survival of archaic forms of animal husbandry. Fred Scholz (1995) has discussed different scenarios and presented us with case histories containing the development of nomadism under political and social change conditions for Africa and Eurasia.

The general pattern is reflected in the following hypothesis: The decrease of nomadism is a prime indicator for the process of modernization. It seems to be part of conventional wisdom as this statement governs quite a literature about the future of nomadic activities.

The same holds true for the livestock-keeping sector within mixed mountain agriculture, i.e., the share of mobile animal husbandry in relation to the crop-raising complex is supposed to diminish in favour of farmstead-based activities. Shortage of shepherds due to alternative income opportunities, out-migration and/or educational obligations are frequently mentioned reasons for social change in this field.

The questions I would like to discuss are whether the impact of yak-keeping can be an useful indicator for economic development under ecological constraints, and which factors dominate. Is there any importance linked to yak-keeping at all? Could this sector find a place in a modernisation process as well?

Second besides these more methodological and general aspects I would like to investigate the livestock sector in the periphery of peripheries. What do I mean by this statement? Quantitatively, Western High Asia contributes only a minor share (cf. Tab. 1) to the overall Inner Asian yak herds. This region has

been neglected in yak research for many reasons lying outside the fields of academic interest.

Pastoralism in the Pamirs

I would like to present some evidence from yak-breeder communities in Western High Asia (Fig. 1). The main emphasis will be on socio-political and economic changes affecting animal husbandry in this region. Here we find yak-keeping in the eastern part of Tajikistan, in the Wakhan strip of Afghanistan, in the eastern Hindukush and northern Karakoram of Pakistan as well as in the Kun Lun Shan of Xinjiang. In this description of the area of distribution one regional term becomes prominent: Pamir. Somehow this term has remained vague up to the present day. Different interpretations and appellative locations prevail in academic disciplines as well as in topographical information.

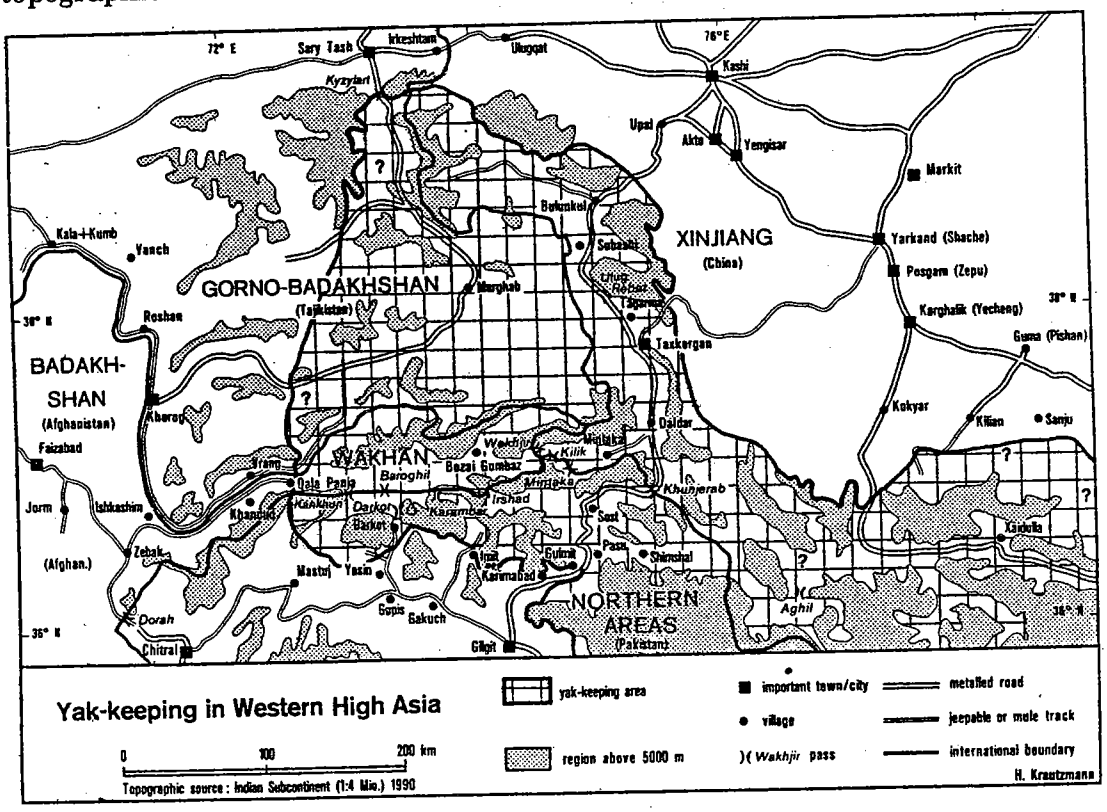

Fig. 1: Yak-keeping in Western High Asia

Some of the characteristic features of these mountain ranges are the enormous levels of glaciation at high altitudes in contrast to extremely arid valley systems. Within this gradient there are to be found extensive pasture areas in flat bottomed upper valleys. These features extend above the zone of artemisia steppe vegetation which reaches up to levels of 3800 m.

Following a local explanation, the Wakhi term *pamer* is understood as a grazing area which offers abundant fodder potential in a compact location. A *pamer* differs from an ordinary summer pasture (*hel*) in its bigger size and its flat appearance. The meaning of Pamir has been subjected to abundant speculation. According to the linguist Bailey[1] *pâ* means 'mountain' and *mira* 'wide plain, plateau' which resembles much of the Wakhi explanation. The co-author of the Wakhi dictionary published in St. Petersburg, I. M. Stéblin-Kamensky, doubts this linkage and consequently omitted such an entry in the volume.

Talking about the Pamir or the plural form Pamirs we can follow the elaborations of George Nathaniel Curzon (1896). In his essay 'The Pamirs and the source of the Oxus' he collected all the material available a century ago. Curzon presented a system which has become the classical background for later attempts of classification. Basically seven major Pamir regions of this description are to be distinguished (Tab. 2). In addition there are some Pamir regions of smaller size which have great local importance: Kara Kul and Sarikol in Xinjiang, Shimshal in the Northern Areas of Pakistan (Fig. 2). The latter are excluded from the system by purists who apply a size criterion in respect to length and width of a Pamir.

These vegetated areas have been of prime interest to nomads and sedentary agriculturists involved in animal husbandry as they provide an '... abundance of pasturage, affording excellent food for every variety of animal ...' (Curzon 1896: 32). The remoteness and seasonality of fodder provision has to be highlighted in these grazing areas, which are located in an altitude range between 3500 and 4300 m a.s.l. In all concerned areas the yak has never been the sole breed brought to those pastures; livestock also comprised goats and fat-tailed sheep for hair/wool and meat production, as well as horses, donkeys and camels (*Camelus bactrianus*), utilised for the transport of household utensils and products. Nevertheless the yak seems to be the best suited for

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[1] Quoted after Dor & Naumann (1978: 24) who take up the classical discussion of the Pamir question elaborated on by Curzon (1896) and Davies (1862).

Tab. 2: The system of Pamirs

Eastern Pamir	**Gorno Badakhshanskaja Avtonomnaja Oblast (GBAO) Republic of Tajikistan**
	• Khargushi Pamir (Pamir of the hare): the basin of lake Kara Köl (black lake)
	• Rang Köl Pamir (Pamir of the coloured lake): the basin of the lake with the same toponym
	• Sariz Pamir (Pamir of the yellow trail): part of the Murghab valley up to the settlement of Murghab (previously named Pamirski Post)
	• Alichur Pamir: the valley of the river with the same toponym
Wakhan	**Wakhan Woluswali, Badakhshan Republic of Afghanistan**
	• Chong Pamir: Great Pamir or Pamir-e Kalan: the headwaters of the Pamir Darya and the basin of Zor Köl (big lake)
	• Kichik Pamir: Little Pamir or Pamir-e Khurd: the headwaters of Aksu river including the lakes Chakmaktin Köl and Besh Ötök Köl
Sarikol	**Taxkorgan Tajik Autonomous County Uigur Autonomous Region Xinjiang, Peoples Republic of China**
	• Taghdumbash Pamir: headwaters of river with same name and Karachukur River

survival under these harsh conditions. The milk-yielding yaks fit into the pasturing cycle of sheep and goats. This period regularly does not exceed three summer months. The non-milk-yielding animals can be left in the Pamirs for much longer. Sometimes the period of grazing for "dry" yaks outside the permanent habitations has been extended up to a full-year circle with occasional control visits by the owners and/or shepherds.

Adaptive strategies in Western High Asia

The two major adaptive strategies of utilising the pasture potential of this region under given ecological constraints have been mountain nomadism and the livestock sector of mixed mountain agriculture.

Fig. 2: Pamir: Location and climatic conditions

– Nomadism has the advantage of mobility. Traditionally nomadic groups were able to exploit natural resources at disconnected locations. Great distances of the order of several hundreds of kilometres separated economically valuable mountain pastures from winter camp sites with areas of lesser economic interest lying in between. In this region that means functional migration cycles including longer stays in high-altitude pastures during summers, and winter grazing in low-lying basins in the northern foothills or plains of the Inner Asian mountain arc. In both areas the nomads are dependent on being tolerated as a mobile group and being able to pay the grazing fees if applicable.

– Mixed mountain agriculture has the advantage of fodder production in the permanent homesteads for herds which are grazed in the high pastures during the summers. The limiting factor here is the provision of nine months' feed which has to be produced on private or common property village lands. Their permanent habitations are located at the upper levels of single-crop farming. The access to the Pamir pastures involves shorter migrations and some mobility within the summer habitations. Fodder here is comparatively plentiful but only available for a short period, feed storage and transport to the homesteads being of limited importance.

Both approaches can result in competition for natural resources in the same location and have frequently been discussed from that perspective. The ecological aspect has been expanded to the debate about conflicting economic strategies. In the discourse of modernisation and social change nomadism's place is usurped by agriculture. The extensive utilisation of marginal resources is superseded by intensification.

Let us investigate some developments in these sectors relating to transformation processes affecting economies based on pastoralism.

1. Stalinist sedentarisation programmes in Central Asia

As the greater part of the Pamirs is located within the Gorno-Badakhshan Autonomous Oblast of the Tajikistan Republic they have been involved in the sedentarisation process of nomads during Stalinist modernisation programmes in the 1930s. At that stage nomadic production and life-style was declared backward. Since then the system of pasture utilisation has been shifted to kolchos settlement centred seasonal migration of herds (cf. Monogarova 1978). As G. F. Dachslejger (1981) and Ernst Giese

(1983) have pointed out for Kazakhstan Republic a long period of decline (1930-1960) was followed by a development which has improved the overall productivity of agriculture. Besides extension of cultivated lands fodder production has been augmented, while the variety of breeds has been increased and the health conditions of the herds improved. Permanent winter stables with adequate infrastructure, veterinary treatment and sufficient fodder contributed to this development, which resembles some aspects of the Pamirian pastoralism of present times.

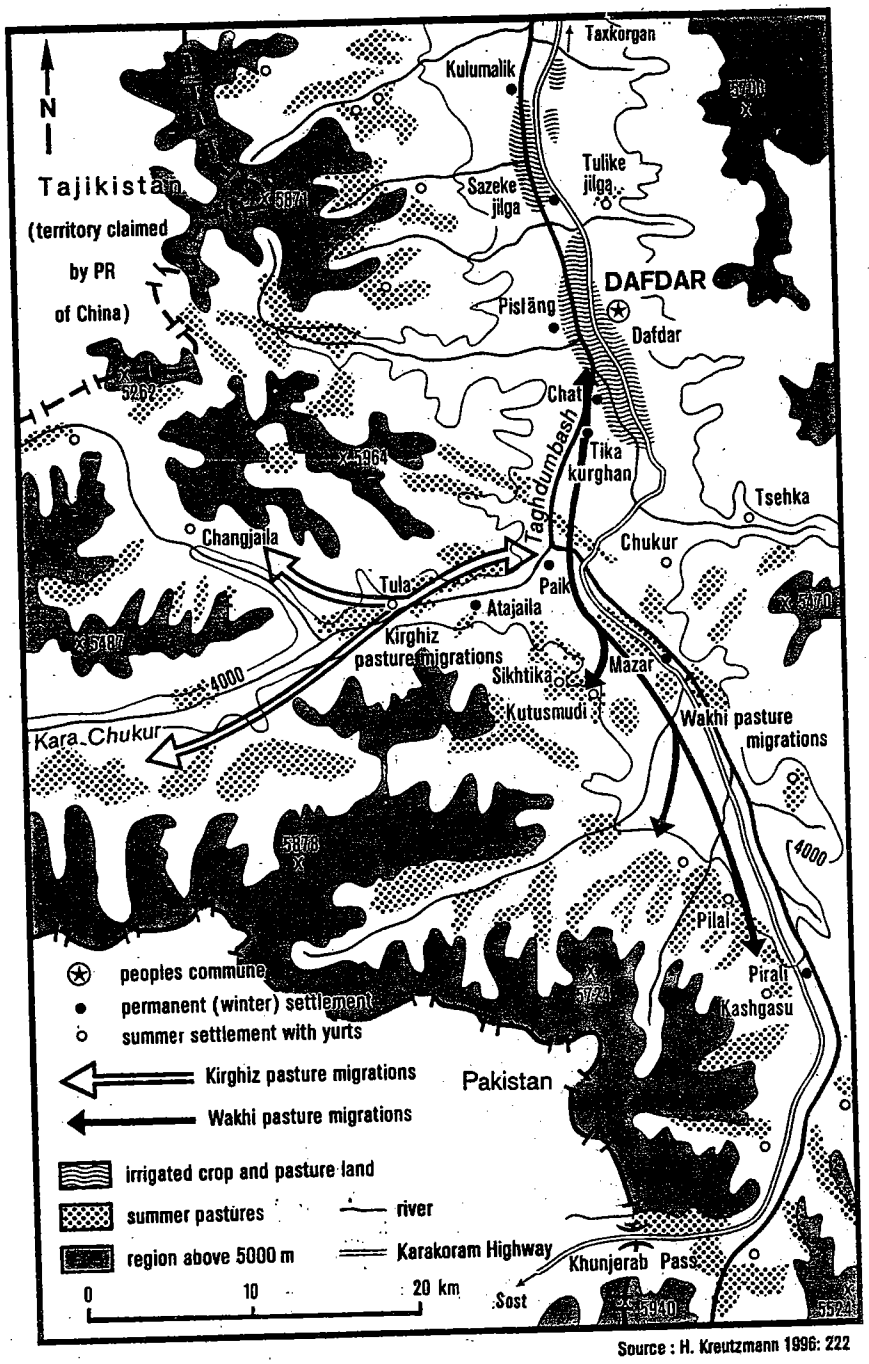
In the Eastern Pamir, part of Tajikistan's Gorno-Badakhshan district, nowadays Kirghiz shepherds and a few Wakhi keep yak herds around traditional supply stations like Murghab (formerly Pamirski Post) from where they undertake seasonal migrations to the higher elevation summer pastures (Tab. 2). Basically nomadism has been converted into a form of mixed mountain agriculture under conditions of collective resource management.

2. Competition between nomads and agriculturalists in the Pamirs (Sarikol)

The Taxkorgan or Sarikol (name of the former principality) area comprises three different ethnic groups, Sariqoli, Wakhi and Kirghiz (here less than 5 % of the population). The former two groups (81.75 % of the inhabitants) follow a mixed mountain agriculture composed of crop raising and animal husbandry with seasonal utilisation of Pamir pastures, while the Kirghiz specialise solely in livestock. All three groups traditionally move their flocks within the Taghdumbash Pamir, and were tributaries to the Mir of Hunza who exercised control on these pastures until 1937 (Kreutzmann 1996: 358-61). While Kirghiz lived in the higher elevations Sariqoli approached from the northern low-lying villages. Only the Wakhi founded their settlement of Dafdar (3400 m) in the heart of the Taghdumbash Pamir with the consent of the Chinese authorities about a century ago. All three groups compete for the fodder resources there (Fig. 3).

Since the Chinese revolution of 1949 and the formation of the Tajik Taxkorgan Autonomous County in 1954 the establishment of rural communes has been organised in the villages. The basic infrastructural assets such as school, police post, health post and barefoot doctor, commune administration and shop, mosque etc. have been provided to all communities of the Taghdumbash Pamir.

Fig. 3: Dafdar: Utilisation of natural pastures



Source : H. Kreutzmann 1996: 222

In post-revolutionary times the number of livestock has been increased by a factor of 4.75 up to 128,800 heads in 1984. This figure covers all stocks of Bactrian camel, horses, donkeys, yaks, other cattle, sheep and goats. Natural grazing provides the overall most important local resource utilised through animal husbandry: the area covered with grasslands extends to 6.09 million *mu* of which 97.6 % belong to natural grazing while 0.13 million *mu* are irrigated meadows (1 *mu* equals 0.067 ha; cf. Tab. 3). More than two thirds of the economic turnover of Taxkorgan County derives from animal husbandry: in 1984: 2.75 million Yuan, compared to 1.18 million Yuan from crop raising (Kashgar Prefecture Chronicle 1985).

In 1960, for the first time since the Chinese Revolution self-sufficiency in food and fodder production was achieved in Taxkorgan County (Xinjiang). Since 1982 the majority of the eleven townships and former people's communes (*renmin gungshe*) have been equipped with a veterinary station supplying vaccines and extension services to the farmers. Experiments with fat-tailed sheep (*dumba, dumbash*) have been carried out and their share in the regional flocks has been increased (H. G. Schwarz 1984: 226). In the heart of the Taghdumbash Pamir a veterinary station specialising in yak-breeding was established in Mazar (south of Dafdar along the Pak-China Friendship Highway, cf. Fig. 3) by utilising the local knowledge of Tajik and Kirghiz shepherds who found employment there. About 400 persons reside in Mazar breeding farm which contains livestock of about 5,000 sheep and 500 yak

Tab. 3: Potential fodder availability of pastures in the Pamir region

Region	Total area	grazing area		available grazing potential				
	in ha	in ha	total	to be utilized		not to be utilized		total
			in %	in tons	in %	in tons	in %	in tons
Western Pamir	2 468 700	1 113 390	45,1	40 990	22,4	141 260	77,6	181 250
- Wakhan	249 200	146 030	58,6	2 630	17,8	12 120	82,2	14 750
Eastern Pamir	2 839 700	1 099 900	38,7	61 400	45,3	74 400	54,7	135 800
Pamir (total area)	5 308 400	2 213 290	41,7	102 390	31,9	215 660	68,1	317 050
Sarikol (Taxkorgan)	5 038 250	374 313	7,4					555 370

Source: Heinrich Walter & Siegmar-W. Breckle, "Pamir - eine ökologisch gut untersuchte Hochgebirgswüste," in Heinrich Walter & Siegmar-W. Breckle (eds.) *Ökologie der Erde*, Vol. 3, Stuttgart, New York: Gustav Fischer, 1986, p. 358 and data provided by the county administration Taxkorgan 1991

(George B. Schaller *et al.* 1987: 53-71). Much bigger herds of yaks are kept by the Wakhi and Kirghiz of the Karachukur Valley draining the westernmost part of the Taghdumbash Pamir. This side valley has become the only Kirghiz-dominated pasture region of the Taxkorgan county. The number of yaks grew from 5,909 in 1981 to 8,147 in 1990 (Fig. 4), the highest figure since 1976. The trading and export value of yaks has been limited, they are mainly utilised for local purposes: milk, butter, *qurut*, hair and meat. In addition their transport capabilities and frugality are regarded as major assets of yaks in the Chinese Pamirs.

3. Kirghiz exodus from the Afghan Pamirs

The Great and Little Pamir within Wakhan Woluswali of Badakhshan Province (Afghanistan) have been studied extensively up to the repeated and probably last exodus of the majority of Kirghiz nomads from there to Pakistan in 1978. Their fate is one of the more prominent cases where border delineation has interrupted traditional migration patterns and where the term 'closed frontier nomadism' was coined.[2]

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[2] See for this Kirghiz group the numerous publications by Shahrani (1978, 1979, 1980, 1984), Dor & Naumann (1978). In 1978 a group of 1300 Kirghiz (280 yurts) fled to Pakistan. Not all members of the Kirghiz group of Rahman Kul (who died in August 1990 in Turkey) joined him after four years of exile in Pakistan to Eastern Anatolia. Rahman Kul alone had to leave 16,000 sheep and goat, more than 700 yaks, 15 horses and 18 Bactrian camels behind while the whole community of the Afghan Pamirs possessed more than 40,000 animals of which only a small herd of 6000 could be taken to exile in Pakistan and none from there. Rahman Kul migrated with his group of 1132 Kirghiz in August 1982 to become the village head of the community in Ulupamir Köy (1800 m) as a member of a government resettlement scheme which provided each household with 10 sheep and goats as well as 3 cattle. Presently this community has grown up to 2000 members following a settled agriculture and animal husbandry with their herds of 7000 sheep, 1000 goats, 6000 cattle (no yaks) and 70 horses (personal communication through Gundula Salk, Berlin, and Bernard Repond, Marsens, Switzerland). A small group of 200 Kirghiz returned to the Little Pamir from Pakistan by October 1979 (Shahrani 1984: 32). Recent information reveals that more than a hundred tent communities are engaged in animal husbandry. Barter trade with entrepreneurs from Northern Pakistan is based on a regular exchange of goods. Kirghiz supply yaks and sheep as well as the hair and wool of these animals, while the Hunzukuts provide them with wheatflour, tea, clothing and other consumer goods.

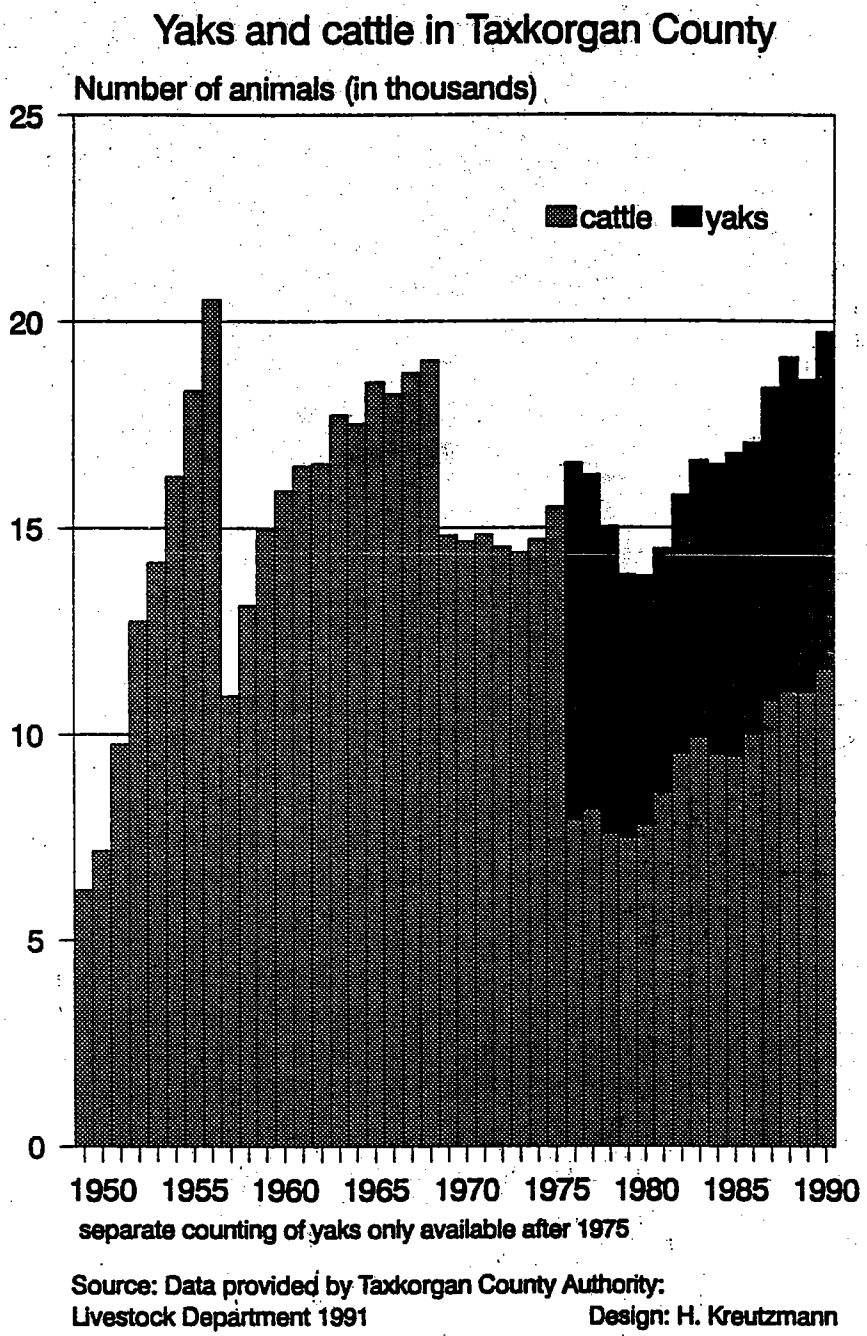

Fig. 4: Yaks and cattle in Taxkorgan County 1949-1990

Again we found here competition between poor Wakhi farmers utilising the Pamirs for summer grazing and rich Kirghiz nomads controlling most of these Pamirs. Impoverished Wakhi did take up jobs as shepherds for Kirghiz herd owners and turned eventually to nomadic strategies (Kreutzmann 1996: 146-53). The share of yaks was about ten percent of the total within the community's herds of about 40,000 animals.

Any form of animal husbandry has been limited to subsistent survival strategies in recent years as traditional exchange lines have been interrupted due to war conditions. The unstable internal situation in Afghanistan has prevented any further research in this area in recent years.[3]

For the time being the refugee Kirghiz group has been resettled in Ulupamir Köy (Ercis District, Turkey) and are now contemplating and negotiating a resettlement programme within the Kyrgyzstan Republic.

4. Kirghiz pastoralists in Kara Köl

The Kirghiz traditionally followed a long-distance nomadic migration cycle between the summer grazing grounds in the Pamirs and the irrigated oases of the mountain forelands where they spent the winter occupied with herding and different other businesses in the towns of Kashgar and Yarkand. This pattern has been abridged within the last 50 years. Nowadays the Kirghiz nomads are confined with their herds to the Pamir regions all year round. Only for marketing purposes do they leave their mountain abodes and travel on foot with their flocks or on the back of trucks down to the Sunday markets of Kashgar and/or Yarkand. Thus, the herds cover the distance of 280 km easily and without great loss of weight.

The pasture system has been adjusted to changed frame conditions. The herds of the Kara Köl Kirghiz are mainly composed of on average 1.5 horses, 1.4 donkeys and 2.5 Bactrian camels. These animals are preferably required for transportation and travelling purposes. The additional livestock sums up

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[3] The latest report by Unidata (1992) on Badakhshan summarises the available information of the agriculture in Badakhshan but does not include any information of animal husbandry in Wakhan Woluswali or yak breeding in particular. Information could be collected from migrant labourers and refugees from Wakhan who live and work in Northern Pakistan. The interviewees confirmed that agriculture follows mainly a subsistence production system. The only market outlet is provided by some barter trade across the border to Pakistan.

on average to 12.2 yaks, 98.2 sheep and 40.1 goats.[4] In comparison: in 1976, the peoples commune of Subashi (Karakul) owned only 0.5 horses, 0.3 camels, 3.5 yaks and 74.9 sheep and goats per household. The total number of livestock ranged in this period around 10,300 animals (Myrdal 1981: 31). Besides state ownership on flocks private property rights for a limited number of animals had been assured for the nomads. The carrying capacity of accessible pastures was calculated for about 40,000 animals, by 1991 the number of heads has reached 30,000.

Relaxed attitudes of the Chinese authorities towards agricultural and livestock production since the 1960s in this area and especially since the reforms of 1978 have led to an increased market orientation and the improvement of natural pastures through irrigation and fencing of meadows. Grass is cut by scythe and winter fodder is stored to cover the long period of meagre natural pasture in the winter settlement (*kishlok*) of Subashi at an altitude of 3600 m.

Administratively the Kara Köl grazing zone forms part of the Aqto division, which is one of the four sub-units of the Kizil Su Autonomous Oblast where the majority of China's 119,300 Kirghiz reside (data for 1984). The majority of the Kirghiz of Kizil Su has become sedentary agriculturists while the inhabitants of the higher Pamirs continue to follow nomadic livestock breeding exclusively. The *kishlok* of Subashi is equipped like other communes with infrastructure institutions such as school, police station, health post and barefoot doctor, commune administration and shop, mosque etc. and as well with a veterinary post controlling the quality and health status of animals. Harsh environmental conditions of survival disguise the fact that the animals raised in these productive pastures compete very well on the profitable markets in the urban oases along the southern Silk Route (Tarim Basin).

Role of yak-keeping in this context

In all four cases presented here yak-keeping has played a major role as yaks are well-adapted to this high-altitude environment. The observation is that wherever animal husbandry is a persistent economic feature yaks remain an important component of the herds. The data available basically show steady figures for yaks while the remaining stock varies much more.

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4 These were collected by the author during the joint German-Chinese fieldwork expedition in the summer of 1991.

An important exception has been observed in Northern Pakistan where in the Hunza region yak numbers have increased in recent years.[5] The permanent deficit in meat supplies on the regional market has challenged local entrepreneurs to rear yak herds in order to market them in the meat bazaars of the Northern Areas. The quality of locally raised yaks is far higher than the appalling low-quality meat of water bufalloes imported from down country Pakistan. This exceptional feature puts yaks into the picture as a marketable resource. In most cases the role of yaks is quite different. Only the extreme deficit in meat supplies has affected the dominant pattern.

From the evidence presented here it seems that yaks are primarily kept for subsistence purposes and as an investment in securities. With a comparatively low labour input substantial life meat stores are available in the appearance of yak herds. Besides there are further spin-off effects in milk and hair production etc. Thus yak-keeping complements the function which is mainly attributed to crop-farming, i.e., to safeguard survival under high mountain conditions. The higher the settlement regions the more importance lies in the combination of crop cultivation and livestock breeding. The subsistence share in this form of a feasible mixed mountain agriculture is

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5 Kreutzmann 1986, 1996. Within the last decade stocks of yaks have been increased through the import of female yaks from the Taghdumbash Pamir in Xinjiang (China) across the Khunjerab Pass and the Karakoram Highway into the Northern Areas and mainly Ghujal subdivision of Hunza (Fig. 1). In 1989/90 alone more than 500 yaks were imported of which one third were retained for breeding purposes while the rest replenished the always deficient meat markets of Gilgit. Out of these 83 female yaks were bought by people of Shimshal, the owners of the Shimshal Pamir with excellent grazing and profitable animal husbandry. In addition thirty female yaks were sold to farmers of Pasu village, changing breeding habits in an important way. Previously, in 1985, there were about 436 yaks in Shimshal and 83 in Pasu (cf. Kreutzmann 1986: 102). These animals (above five years of age) fetched a price of Rs 4000 each, i.e., an average price of US $ 200 per yak. This initial consignment affected the meat prices of Gilgit Bazaar dramatically and led to a slump: the reason was that in addition to these yaks a flock of 1500 fat-tailed sheep and goats had been imported. Nevertheless, the improvement of breeds through imports from China has become a regular practice which is encouraged by the Aga Khan Rural Support Programme (AKRSP), the most prominent development project in the area, targeting the increase of livestock production among others. Under the supervision of a veterinarian from Gilgit suitable female yaks have been selected and immediately directed towards the interested villagers' cattlesheds in the region.

Plate I: Wakhi yak-breeder on the Taghdumbash Pamir (Tajik Autonomous county, Xinjiang Region, China). The yak is an important species in the herd composition of Kirghiz nomads as well as Wakhi and Sariqoli farmers who utilise the natural grazing of the Pamirs (3600-4500 m) during the summer season. The nomadic space for pasturing has been reduced by the extension of permanent settlements into the rim of the Taghdumbash Pamir.

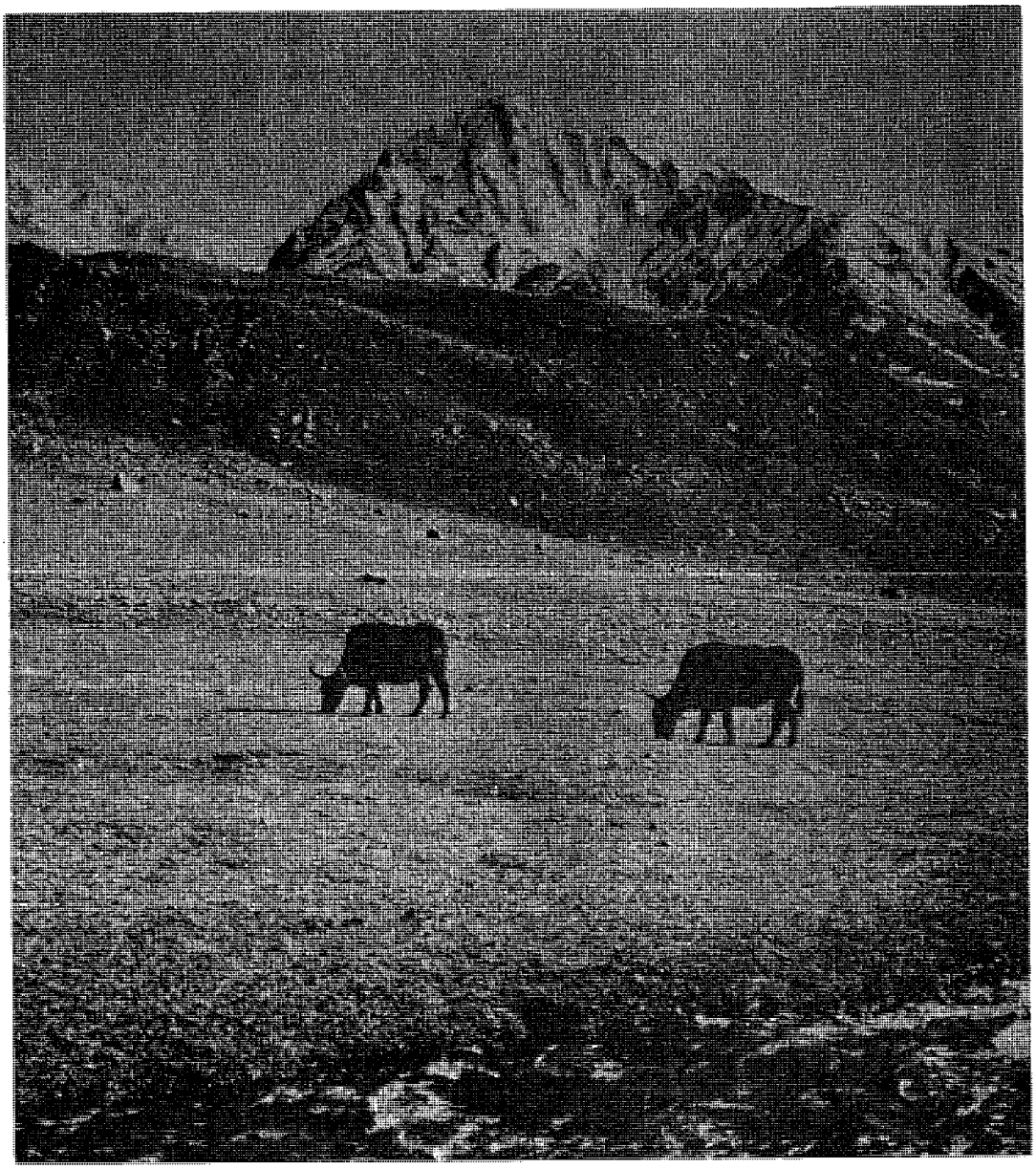

Plate II: Yak-keeping in the Khunjerab Pass region (4500 m) of Northern Pakistan. Non-milk-yielding yaks have been released on these pastures to remain in the grazing grounds all year long. They survive the harsh winter conditions and are fattened during summers. Only from time to time are they visited by their owners.

characterised by the cultivation of well-adapted bread crops and an interrelated livestock component providing dung, fuel and traction power besides the consumable goods mentioned above. Yaks play a prominent role in this respect of search for security.

Other bovines as well as sheep and goats are predominantly kept for marketing purposes. Consequently their numbers have varied much more under changing socio-economic frame conditions. In the context of planned economies a shift to fat-tailed sheep and goats could be observed, a trend which has gained in momentum after the relaxation of rules and regulations. Those animal herds are basically responsible for dramatic changes in vegetation cover. In the Kara Köl Pamir their numbers have tripled since the reforms of the late 70s and fat-tailed sheep are in great demand in the urban markets at the rim of the mountain arc.

Yak-keeping seems to be a less important indicator for socio-economic change in Western High Asia. Nevertheless yaks play a vital role in the domestic economy and substantiate any attempt to create sustainability in the animal husbandry sector. Livestock-keeping has always been a risky undertaking in high mountain regions. The safety factor is served best in the animal herds when enduring yaks utilise marginal pastures in remote locations.

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