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HIGH MOUNTAIN PASTORALISM IN NORTHERN PAKISTAN

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HIGH MOUNTAIN ECOLOGY AND ECONOMY POTENTIAL AND CONSTRAINTS

ECKART EHLERS & HERMANN KREUTZMANN

1. SUSTAINABLE AGRICULTURE IN A HARSH ENVIRONMENT

Development experts in general and protagonists of improved livelihood conditions in high mountain regions in particular tend increasingly to advocate the concept of sustainability. The creation and preservation of a stable socio-economic environment based on local resources remains to be a central focus of sustainable development. In an environment devoid of favourable conditions for productive crop production and animal husbandry two aspects are prominent in the discussion about future prospects:

- first, the strategic aim of an agricultural system which provides the basics for a growing population on a long-term basis without over-exploitation of available natural resources.
- second, the development of the specific potential of high mountain regions for the combination of production strategies in different ecological zones (Fig. 1).

Both approaches are rather restricted towards high mountain regions in developing countries (cf. JODHA, BANSKOTA & PARTAP 1992, JODHA 1997), whereas the respective areas in industrialized countries are characterized by economies preferably dependent on the secondary and tertiary sectors (cf. LICHTENBERGER 1979, UHLIG 1995). It is still an open question which future role and function high mountain agriculture may play in the Third World when it is embedded in an overall market economy where low sustainability levels are attributed to its competitiveness (RIEDER & WYDER 1997).

For the purpose of this study it is more important to note that obviously no role models for a sustainable high mountain agriculture or other harsh environments are provided from those countries where the major donors in development aid and assistance are located. However, replicable examples have been derived from case studies in remote regions of Africa, Asia and Latin America (cf. for example CASIMIR 1991, KRINGS 1991, RICHARDS 1985) and rarely touch high mountain environments. Besides, the great majority of studies which were investigating experiences with sustainable agriculture have been focusing on the so-called traditional sector in a rather isolated manner. They neglected very often the fact that agriculture is only part of a much broader rural economy and part of an often intricate system of labour division.

In view of the fact that high mountain agriculture is in most cases more than agriculture per se, it may be appropriate to stress from the very beginning that

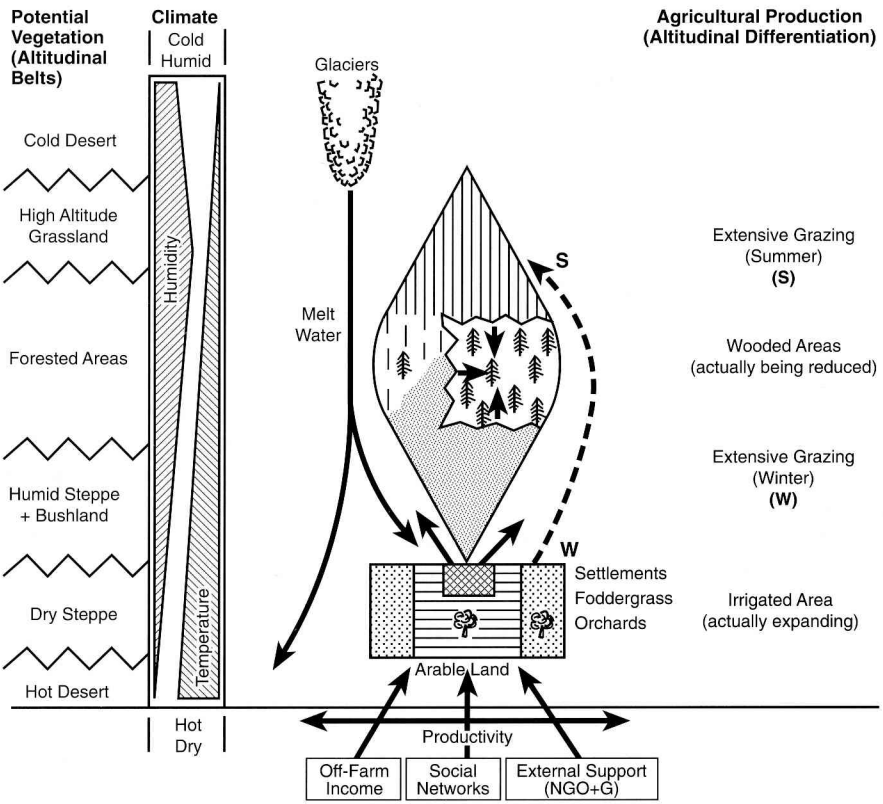


Fig. 1: Vertical arrangement of natural vegetation and agricultural productivity (Source: M. Winiger 1996)

mountain livelihoods are mostly based on a combination of various income sources: agriculture, pastoralism, forestry, handicrafts, various services and trades and – more recently – local industries, tourism or mountaineering provide a diversity of household incomes in various combinations. Such a statement does not imply that the majority of mountain dwellers may still be subsistence farmers or are depending in their majority on agricultural practices. But for a substantial number of mountain dwellers agriculture remains to be an enterprise based on locally available resources and an economy providing a significant share to the household income. The complex set of contributions to the household income cannot disguise the fact that the agricultural sector functions as a safety valve when other occupations fade and non-agrarian enterprises fail. Thus it seems worthwhile to devote a separate study to high mountain agriculture and certain aspects of it.

2. HIGH MOUNTAIN AGRICULTURE

In contrast to profitable agricultural practices in highly productive core regions, often symbolized by mono-cultural cultivation patterns and/or farming practices involving substantial technological and financial inputs, adaptive strategies in the peripheries of the ecumene are regularly characterized by the combination of different resources. The combination of crop-farming and livestock-keeping seems to be the basis of almost any high mountain agriculture. Both sectors interrelate and are linked (Fig. 2). The livestock provides substantial amounts of animal manure to fertilize the fields, while a certain part of the cultivated lands has to be reserved for the fodder production. Parcels of land solely reserved for animal husbandry might carry alfalfa crops (*Medicago sativa*) or comprise irrigated or non-irrigated meadows. Grass and lucerne cultivars are cut several times per growing season. In addition, other cultivated plants contribute consumable parts such as leaves, residue or straw for the livestock. Fodder is stored to support the livestock during seasons when natural grazing is not available or too limited. Thus in a high mountain agriculture both sectors are interdependent which led RHOADES & THOMPSON (1975) to suggest the terminus of "mixed mountain agriculture". In their search for an appropriate and universal terminology they refrained from projecting concepts derived from European experiences onto non-

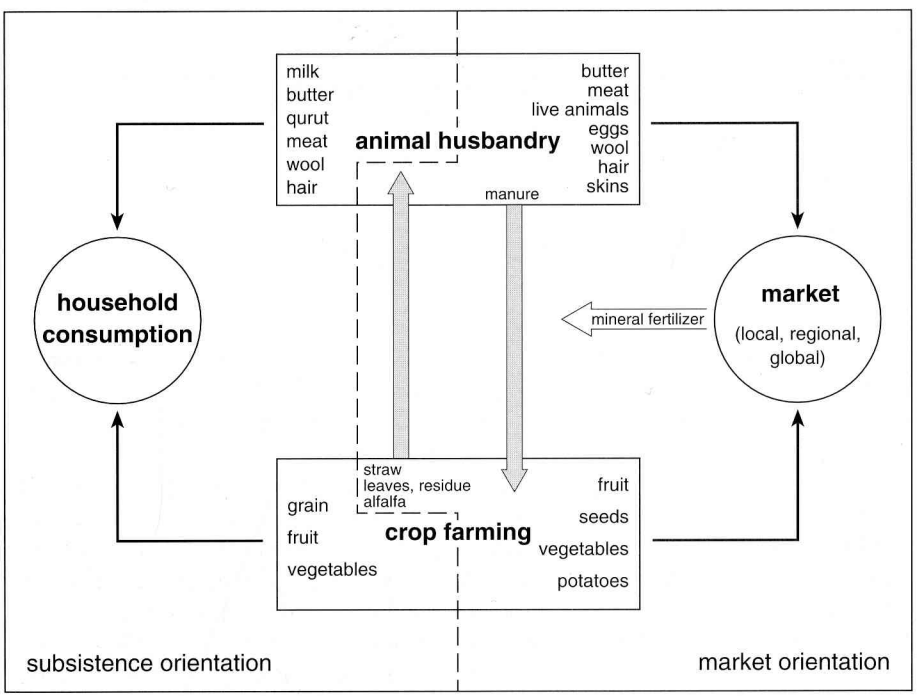


Fig. 2: Exchange relationships in high mountain agriculture

European situations and locations. The "mixed" mountain agriculture addresses a set of different activities and sources of income which are interdependent in resource utilization strategies, the management of farms and the division of labour. This somewhat neutral ascription of a dominant human intervention in high mountain regions functions as an umbrella for specialized and regionally differentiated articulations. Presently we find its application in High Asia when the International Centre for Integrated Mountain Development (ICIMOD, based in Kathmandu) addresses agricultural practices in the Hindukush-Karakoram-Himalaya as "mixed crop farming systems" (ICIMOD 1998).

The combination of crop cultivation and livestock-keeping is more widespread and complex in the Old World and especially in the high mountain regions of Asia than anywhere else (cf. BISHOP 1990, CROOK & OSMASTON 1996, EHLERS 1976, 1980, BALLAND 1988, JENTSCH & LIEDTKE 1980, PRICE & THOMPSON 1997, STEVENS 1993, RATHJENS, TROLL & UHLIG 1973) as shall be shown below.

The concept of verticality, sometimes addressed as vertical control, was developed in the Central Andes. Mainly it was projected onto tropical mountains of other continents and it highlights the layered structure of agricultural potential along the gradient of the slope creating specialized production and exchange of goods between ecological zones (BRUSH 1976a, b, BRUSH & GUILLETT 1985, FORMAN 1978, MAHNKE 1982, MURRA 1975). "Classifications of types of verticality have been developed to make the extension of the concept more useful. BRUSH (1976b) distinguishes "archipelago" types (the different zones are controlled by the same group are and non-contiguous and often separated by great distances), the "compressed" type (the zones controlled by the same group are contiguous), and the "extended" type (the zones are contiguous but controlled by different groups, who engage in barter or market sale); FORMAN (1978) adds a "mixed" type, which includes access by one group to multiple zones both by direct control and through market exchange." (ORLOVE & GUILLET 1985, 9). Different crops are cultivated in a number of layers. Traditionally livestock-keeping was mainly restricted to the upper zone (*tierra helada*), lacking the seasonal migrations of the above-mentioned high mountain agriculture. Its interrelationship with the crop cultivation complex is weaker as the manure producers (= livestock) are normally not moving to the village lands for fertilization. Basically periodical herd migrations and the seasonal availability of natural grazing distinguishes tropical and subtropical strategies. In recent years the cultural-geographical and anthropological discussion has stressed that the compressed type of vertical control resembles very much mixed mountain agriculture or what is grasped as "Alpwirtschaft" (BRUSH & GUILLET 1985, GUILLET 1983, ORLOVE & GUILLET 1985, RHOADES & THOMPSON 1975).

The historical context, different influences and research perspectives directed towards mountainous resources were made responsible for the classificatory stalemate. Consequently, attempts to transfer the verticality approach to Inner Asian mountain systems (CASIMIR & RAO 1985) were introduced as a means to compare the utilization strategies in different ecosystems and connected production systems. The emphasis in the following discussion is put on animal husband-

ry as an integral part of a more complex socio-economic system. Livestock-keeping and/or crop cultivation are two aspects of primary production while a varying number of non-agrarian activities contribute to household-based enterprises and incomes in addition. The share and degree of primary production may vary significantly in space and time.

3. PASTORAL PRACTICES IN HIGH MOUNTAIN REGIONS

The spectrum of animal husbandry in high mountain regions transgresses its sole incorporation into the complex of sedentary agriculture. Pastoral practices solely devoted to livestock-breeding are found in high mountain regions as well. For the purpose of clarification it seems advisable to devote some attention to the different practices which can be identified in high mountain regions. Guiding principle in this approach is neither the search for essential types nor the regionalization of utilization strategies. Categories are solely introduced for the purpose of stream-lining practices which incorporate different adaptive and socio-economic livelihood strategies.

In the general discussion of pastoralism classificatory concepts derived from European experiences are projected onto other areas. Principally there is nothing detrimental about applying terms such as "Almwirtschaft/Alpwirtschaft" from the European Alps or "Transhumance" from the riparian mountain regions of the Mediterranean Sea to phenomena which follow a similar practice when the contents is specified. But very often the application of these terms is neclecting local socio-cultural conditions. Secondly, sometimes models of such practices are presented as "typical" which, however, describe cases of only recent existence. A diagram from ARBOS (1923, 572) depicting the movement of mountain farmers and their livestock in the French Alps (Tarentaise) is typical. It was reproduced as the only model in the textbook of PRICE (1981, 413) more than half a century after its conception. A second somewhat younger case is the diagram created by PEATTIE in 1936 in which he presented a time-space model of the seasonal migration by people practicing "Almwirtschaft" in the Val d'Anniviers of the Swiss Alps. Since the 1950s this practice has ceased, but the diagram was published again and again (GRÖTZBACH 1982, 10, 1987, 65, 1988, 27). The latest appearance occurred in GRÖTZBACH & STADEL (1997, 26). The reproduction again and again support the impression of stagnant features in high mountain regions and less susceptibility to social change. On the other hand, we find a number of cases – evidence from High Asia will be presented in the contributions of this volume – where a wide spectrum of pastoral practices is very much alive and prominent in every-day life.

BEUERMANN (1967, 17–31) and SCHOLZ (1982, 2–8; 1992, 7–16) provided a consistent descriptive scheme of categories for the interpretation of non-stationary forms of animal husbandry. For the scope of this study three classes/categories are introduced which are linked to the utilization of high mountain pastures by distinguishing mobility patterns, socio-economic organization and property rights (Fig. 3):

(i) *Mountain Nomadism*: The nomadic economy and labour activities are predominantly based on animal husbandry. Mixed herds are composed of sheep and goats, cattle/yaks for livestock production and camels, horses and donkeys mainly for transport of tents, household goods and utensils. The whole group covers great distances between lowlands and highlands during their seasonal migrations towards suitable and accessible pastures. The mobile communities show strong kinship relations. As a rule they distinguish themselves from their neighbours and business partners as a social group of livestock proprietors and traders. Nomads utilize pastures for which they claim the rights of access based on customary law, nevertheless grazing taxes are levied and paid to the state or private persons. Such are the business relations for pastures in addition to barter trade with farmers for basic goods such as grain. Traditionally mountain nomads have engaged only in very few side activities beyond animal husbandry such as transportation, trade, services and other businesses while crop cultivation was no practice attributed to nomads. The absence of permanent settlements and village lands resulted in a mobile society in which movable property including tents and yurts was characteristic and provided shelter in the grazing grounds. Both traditions have been changed quite tremendously in all societies in recent years (Photo 1). Planned and forced sedentarisation of nomads, the introduction of permanent

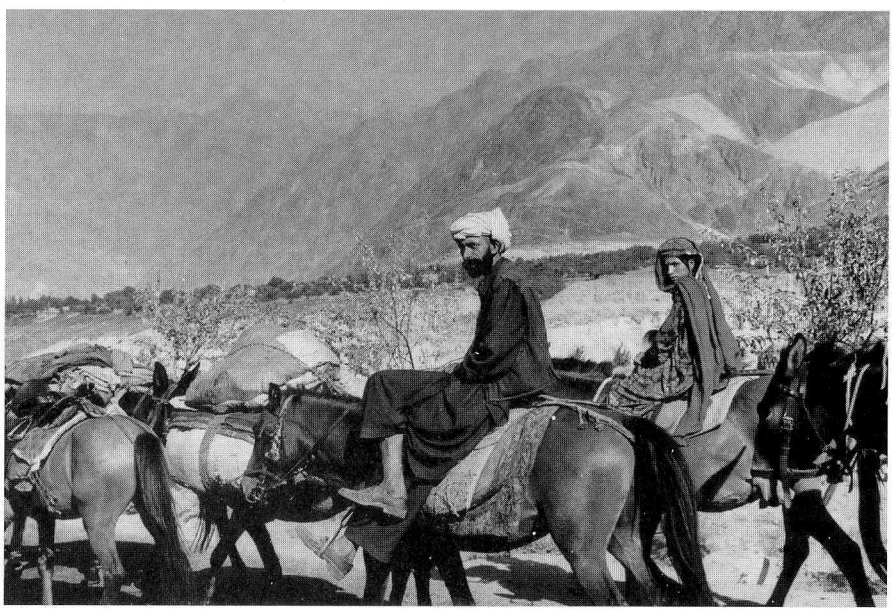


Photo 1: Bakarwal nomads shifting camp from the Nanga Parbat region down the Indus Valley. Some members of the grazing community move ahead of the flocks to set up camp. The Karakoram Highway provides a comfortable route for part of the migration (H. Kreutzmann, September 27, 1995).

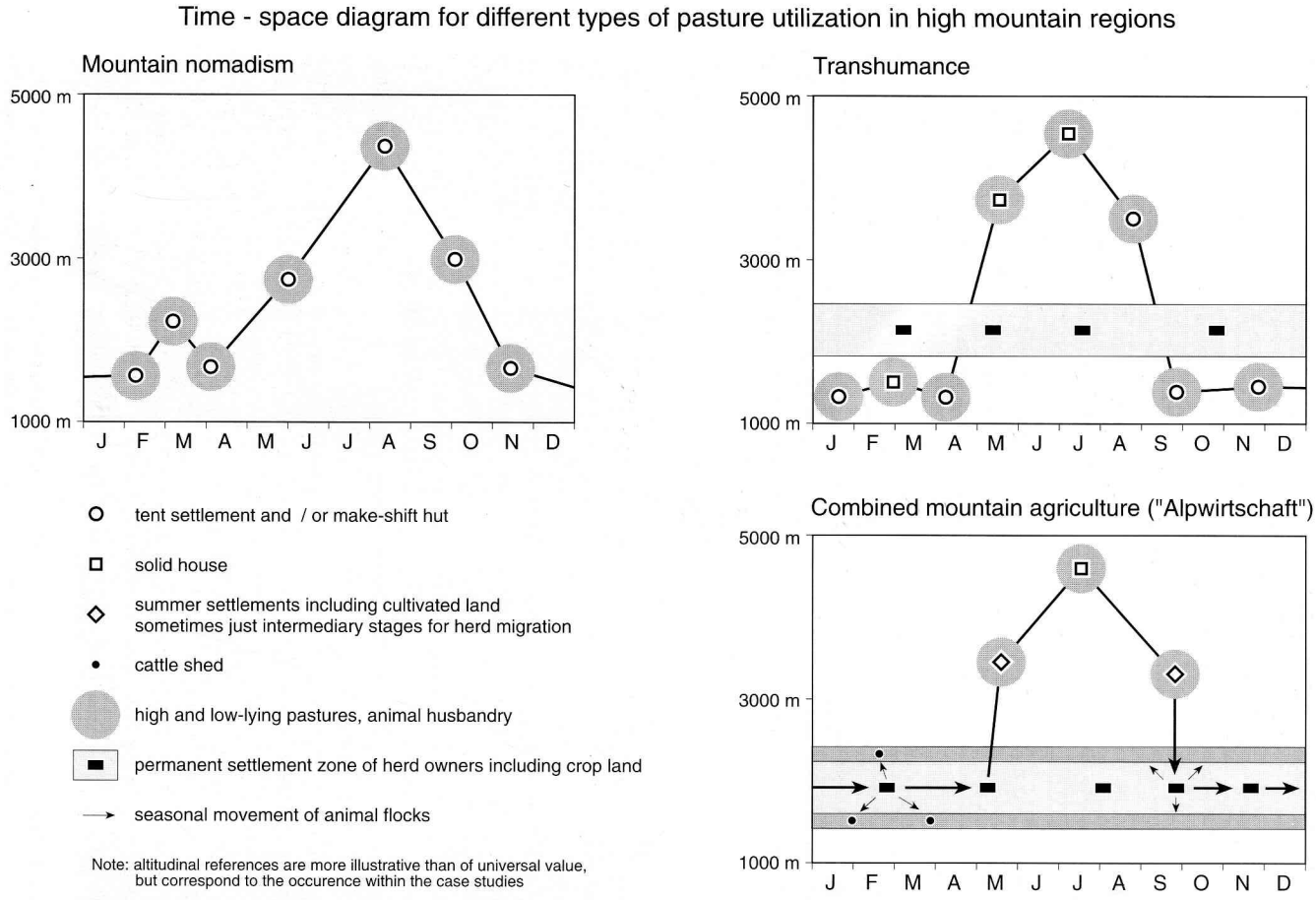


Fig. 3: Time-space diagram for different types of pasture utilization in high mountain regions

winter camps, agrarian reforms and socio-economic change have resulted in adjusted and comparatively confined migration cycles. All factors have contributed to a controlled mobility with features of permanency such as houses and stables in a community settlement. The expansion of crop cultivation and village lands, the reduction of available space and the progression of bureaucracy have limited the rangelands and pastures accessible for nomads. Territorial, political and private delineation of boundaries increased the phenomenon of "closed frontier nomadism" (SHAHRANI 1979). For anthropological and cultural-geographical contributions in the spectrum of mountain nomadism cf. BALLAND 1988, BARFIELD 1993, BARTH 1956a, b, BHASIN 1996; CASIMIR 1991, EHLERS 1976, 1980, GOLDSTEIN & BEALL 1990, GOLDSTEIN, BEALL & CINCOTTA 1990, HÜTTEROTH 1959, 1973, JEST, 1973, JETTMAR 1960, KHATANA 1985, KREUTZMANN 1995a, 1998b, LANGENDIJK 1991, RAO 1992, SCHLEE 1989, SCHOLZ 1982, 1991, 1992, 1995, 1999, SHASHI 1979, E. STALEY 1966, STÖBER 1978, 1979, 1988, TUCKER 1986, UHLIG 1962, 1965, 1973.

(ii) *Transhumance*: Described about a century ago as a regional pastoral practice in Southern France, the term transhumance has gained many connotations and global application in recent years. Sometimes it is used in a wide sense synonymous for pastoralism and nomadism as a comprehensive concept in Anglo-American publications, sometimes it describes pastoral practices linked to certain ethnic groups while the narrow interpretation with a focus on flocks prevails in non-English language usage (BLACHE 1934, RINSCHEDE 1979, 1988, 97–98). The latter addresses some features of the livestock-related agrarian activities originally observed in the riparian states of the Mediterranean Sea. Transhumance (Fig. 3) involves seasonal migrations of herds (sheep and goats, cattle) between summer pastures in the mountains and winter pastures in the lowlands. In contrast to mountain nomadism the shepherds of a migrating team are not necessarily that strongly affiliated with each other to form a group of relatives managing their own resources. The shepherds serve as wage labourers hired by the livestock proprietors on a permanent basis. As a rule the shepherds are neither related to them, nor do they have livestock of their own. The proprietors of the flocks can be farmers or non-agrarian entrepreneurs. Management-wise the year-round migration between suitable grazing grounds is independent from other economic activities of the proprietors. In case they are farmers, their farm management and agricultural activities are not interrelated with their livestock. Nevertheless sometimes proprietor farmers provide shelter and grazing on their fields after harvest or on meadows. Usually common property pastures are utilized in the mountains while customary rights or contracts with residents in the lowlands establish the winter grazing conditions. Shepherds live in mobile shelters (tents, carts etc.) or in permanent houses provided to them. Transhumance of this kind is found in mountainous regions of all continents (cf. RINSCHEDE 1988, 99–100), there is no general trend of decline to be observed although its share in pastoralism varies in wide ranges. For contributions to the scholarly discussion of transhumance cf. BEUERMANN 1967, CHAKRAVARTY-KAUL 1998, GRÖTZBACH 1972, 118–120, HOFMEISTER 1961, JETTMAR 1960, KHATANA 1985, MANZAR ZARIN & SCHMIDT 1984, RINSCHEDE 1979, 1988, SNOY 1993, UHLIG 1995.

(iii) *Almwirtschaft/Alpwirtschaft or Combined Mountain Agriculture*: The terms "Alm" (Austrian, Bavarian), "Alp" (Swiss) and "alpage" or "élevage avec estivage" (French) refer to the high pastures as a characteristic and epigrammatic feature of the European Alps. In this narrow sense only one seasonal aspect of high mountain agriculture is addressed, the utilization of alpine grazing grounds by mountain farmers during summer. At the same time "Alp/Alpen" is a term describing the whole mountain system or a general mountain range. Consequently "Alpwirtschaft" could be understood as the specific form of agriculture prevalent in the European Alps. In the wider sense it adresses what RHOADES & THOMPSON (1975) understand as mixed mountain agriculture and what GUILLET (1983, 562-563) introduced as the adaptive strategy of "Alpwirtschaft". While they identify it as "agropastoral transhumance", this viewpoint is questionable. There are a number of differences between both strategies in livestock-keeping. In Alpwirtschaft (Fig. 3) the proprietors of the flocks are residents of the home-

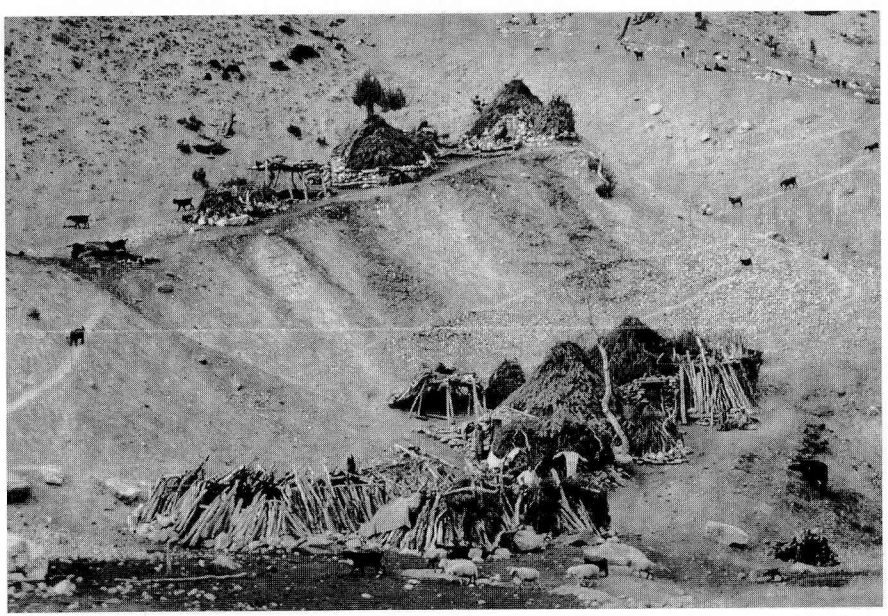


Photo 2: The summer settlement of Bari (3300 m) in the Ishkoman Valley (Ghizer District). The huts and animal sheds are constructed of locally available stones while the cone-shaped roof is assembled of juniper branches. In these settlements the lactating herd animals are kept during the night where they are milked in the evening and in the morning before being brought daily to sometimes quite far away pastures. Shepherds process the milk and care for the new-born animals during the day here. In addition they collect firewood and construction timber as well as animal manure for transport to the homesteads (H. Kreutzmann, September 3, 1990).

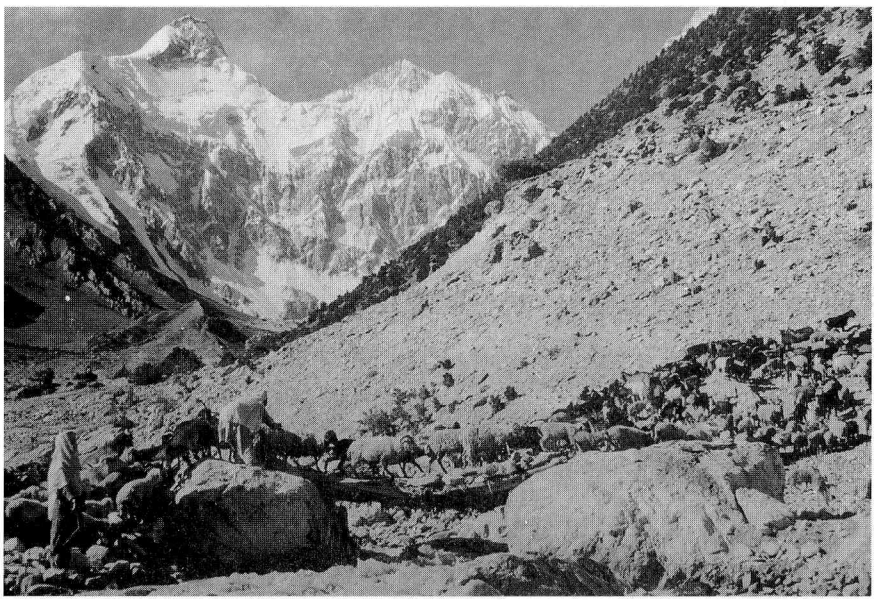


Photo 3: The pasture settlement of Boiber (3400 m) above Abgerch in Gojal (Hunza). The flocks of sheep and goats are kept overnight in a pen and are brought to the daily pasture in higher locations by female shepherds while ailing and weak animals remain in Boiber where the other women spend the day with the processing of milk, preparation of food, collection of firewood and manure etc. (H. Kreutzmann July 8,

steads in the valley grounds. They initiate and control the organization and management of the grazing cycles as a measure to increase agricultural productivity and livestock numbers in a given territory. The example of the Hindukush-Karakoram-Himalaya region shows that not only the herd sizes can be increased by incorporating high pastures into the domestic economy. But at the same time the quality of natural grazing in the high pastures has been estimated as double to quadruple of that in the lower zones of the arid mountain valleys (SHEIKH & KHAN 1982, quoted in STREEFLAND, KHAN & VAN LIESHOUT 1995, 85). On the one hand, the agricultural production in the homestead is strongly linked to the livestock sector by growing grass and storing hay for the winterly provision of fodder. During the winter period the flocks are kept in stables or in the open close to the permanent dwellings of the mountain farmers. The shepherds are traditionally members of the extended family although in recent years a tendency for the employment of hired professional labourers can be observed. With growing job opportunities it becomes more difficult for mountain farming households to provide the manpower especially during the summer season when the agricultural workload is high and other monetary job opportunities might be available. Thus it

is a quite common feature that households pool their livestock and send the herds with a trusted person or a hired professional to the summer pastures which are mainly part of common property (Photos 2 & 3). For classical and recent contributions to the discussion of Alpwirtschaft cf. AZHAR-HEWITT 1999, BHASIN 1996, BISHOP 1990, BUTZ 1996, FRÖDIN 1941, HERBERS 1998, HERBERS & STÖBER 1995, HEWITT 1989, ITURRIZAGA 1997, JEST 1974, 1975, KARMYSCHEVA 1969, 1981, KREUTZMANN 1986, 1999, KUSSMAUL 1965, MUKHIDDINOV 1975, NÜSSER 1998, 1999, NÜSSER & CLEMENS 1996, PARKES 1987, SCHWEIZER 1985, SNOY 1993, STADELBAUER 1984, STALEY 1966, 1969, 1982, STEVENS 1993, TROLL 1973, UHLIG 1976, 1995.

As will be seen in the contributions to this collection of articles, the direction of change and the related adjustments to households' division of labour and responses for agricultural activities are a complex set embedded in the overall economy. Pastoral activities can only be understood as part of the domestic economy. Some authors attributed to the livestock sector such an importance that they identified the utilization of pastures as the key indicator for a cultural-geographical typology of high mountain systems (GRÖTZBACH 1980). This view forms a cultural-geographical response to Carl TROLL's (1962, 1972, 1975) three-dimensional landscape classification and comparative high mountain geography which was dominated by a geo-ecological structuring. The essential features addressed were ecological zones. From the point of human intervention the time-space relationship between crop farming in suitable locations and animal husbandry in the highest available locations above the tree-line was perceived as the most important aspect for typological purposes. GRÖTZBACH (1980, 273) differentiated high mountain regions world-wide by assessing the degree of intensity in mountain livestock-keeping and pasture utilization. In his overview, the extra-tropical mountain ranges of the Old World are identified as regions of medium intensity (European Alps, Pyrenees, Abruzzis, Carpathians, and the high mountain ranges of the former Soviet Union) and high intensity (Atlas, Himalayan system, and the high mountain ranges of the Middle East). The contributions to this compendium are located in the latter group. Nevertheless SCHWEIZER (1984, 36) has pointed out that these classificatory specifications are not leading to an identification of relevant research topics. They belong rather to the ivory towers of academic institutions. It has been a long way to discuss sustainable agriculture in the context of high mountain research. The changing perspectives upon high mountain pastoralism might be illustrated, with a few sketches.

4. STATE OF THE ART: DEVELOPMENT OF RESEARCH ACTIVITIES IN THE FIELD OF HIGH MOUNTAIN PASTORALISM

Initial impulses for high mountain research stem from studies in the European Alps which have functioned as a model region for empirical studies and for conceptual approaches at large. This also holds true for one of the earliest

attempts to analyze the closer interactions between society and montane environments: Jules BLACHE's "L'Homme et la Montagne" (1934). Although covering a worldwide perspective, this book – strangely enough – not only omits the Himalaya-Hindukush region, but focusses remarkably strong on alpine and mediterranean Europe. It may be therefore allowed to say that it was especially Carl TROLL who has broadened the perspective by interpreting the existing literature in a comparative view and by supporting research activities outside Europe. In the early stages high mountain research remained to be heavily concentrated on ecological features. With a considerable time gap cultural geographers joined in and developed their own classifications. Research topics have been e.g. demographic pressure (DE PLANHOL 1968, SKELDON 1985), the utilization of high altitude pastures (EHLERS 1976, 1980, GRÖTZBACH 1980, RATHJENS 1973, UHLIG 1976, TROLL 1973), high mountains as human habitat (BLACHE 1934, BRUSH 1976, GUILLET 1983, GRÖTZBACH 1982, PANT 1935, PEATTIE 1936, RHOADES & THOMPSON 1975, SCHWEIZER 1981, UHLIG 1984). A comparative cultural geography of high mountain regions (GRÖTZBACH 1976, JENTSCH 1977, RATHJENS 1968, 1981, 1982, RATHJENS, TROLL & UHLIG 1973, SCHWEIZER 1984, VEYRET & VEYRET 1962) as well as aspects of human impacts on mountains (ALLAN, KNAPP & STADEL 1988, PRICE 1981, SOFFER 1982), moved into the centre of attention. The utilization of high pastures and changes over time played a vital role in those studies. In the early eighties the complex system of ecology and economy, as well as the antagonism of self-reliance and dependency in mountain regions, was highlighted and led to a number of studies. Pastoralism formed one of the three major fields of interdisciplinary interest along with a focus on forest depletion and water utilization. National research efforts, such as the report on "the transformation of Swiss mountain regions" (BRUGGER ET AL. 1984) and the supra-national UNESCO programme "Man and Biosphere", furthered the knowledge of environmental, economic and cultural processes in the Alpine belt and initiated intensified scientific activities in this field. An overview of the results of comparative high mountain research was presented by HEWITT (1988), RATHJENS (1988), UHLIG (1984) and UHLIG & HAFFNER (1984), the latter date the beginning of research interest in "Alpwirtschaft" back to the first decade of the 20th century (SIEGER 1907) .

Voices could be heard demanding more integrated research efforts (CHAUBE 1985, LAUER 1984, 1987, SINGH & KAUR 1985), as well as expecting an increased attention towards changing traffic infrastructures, accessibility (ALLAN 1986) and the integration of mountain regions in the global economy (KREUTZMANN 1993a, 1995b). The attempt to broaden the view for a holistic approach led to greater emphasis on defining common research topics. Again the utilization of high pastures featured prominently as the transformation in the household economy affected all sectors of mountain agriculture. The changing division of labour, outmigration, tourism and non-agrarian employment affected the availability of pastoral workforce significantly; at the same time the impact of education was strongly felt. The complexity and interdependency of mountain economies was acknowledged and left the simplistic distinction in tradition and modernity (BISH-

OP 1990, KREUTZMANN 1989). The perceived need for multidisciplinary perspectives was increased by the attempt to view mountain regions as part of a highland-lowland exchange system incorporating the dimension of a world economy in which mountain communities participate on different levels. Such a view was acknowledged and easily accepted in respect of mountaineering, trekking and recreation tourism, but less obvious in studies focussing on culture and nature conservation. The protection of endangered ecological niches and ecotopes, as well as the provisional function for natural resources, has been highlighted in recent years.

In an exemplary manner research deficits were exposed by questioning the validity of the so-called "Theory of Himalayan Environmental Degradation" (IVES 1987) and realizing the "uncertainty on a Himalayan scale" (THOMPSON, WARBURTON & HATLEY 1986). Methodological shortcomings, particularistic approaches and isolated mono-disciplinary studies resulted in the equivocal statement of the "Himalayan Dilemma" (IVES & MESSERLI 1989), which revealed many significant research deficits and a multitude of development problems in a particular mountain belt. Nevertheless, shortcomings in the human sphere were more than obvious.

Presently mountain research is directed towards a continuation along the path of homogenization of methods and problem-targetted studies with a regional focus (MITCHELL & GUILLET 1993, KREUTZMANN 1998a, STELLRECHT & WINIGER 1997, STEVENS 1993). Nevertheless, the integration of local scholars, activists and professionals remains to be a desideratum not only in defining research topics but in cooperative research programmes as well. As a contribution towards the "Rio+5 Conference" in New York in 1997, a further combined effort resulted in the publication of "Mountains of the World. A global priority" (MESSERLI & IVES 1997) in which efforts for sustainable development embodied in local communities are advocated. It is before the specific background of this publication and the wealth of applicable suggestions that it contains the following plea: to conserve and preserve the upper reaches of the alpine and subalpine mountain environments as an indispensable token of future sustainability and as a viable protective resource for generations to come. Such a plea should not be misunderstood as a "benevolent recommendation" from far away and from a representative of a society which can afford protection of natural environments almost like a luxury item. The contrary is the case: high mountain environments in industrial countries like the European Alps or the North American Rocky Mountains have suffered over centuries from ecological mismanagement and brutal economic exploitation – partly as a result of the historical poverty of the mountain dwellers, partly because of the greed of the forelanders in regard to the montane forests, water energy, and mineral resources. The results of such short-sighted exploitation have, however, been disastrous in the long run. Therefore: it is experience that lies behind these recommendations and that tries to ensure future sustainability.

Especially the volume edited by MESSERLI & IVES (1997) contains a wealth of suggestions and strategies in regard to the sustainable development and the role

of pastoralism in montane ecosystems. Thus JODHA (1997, 313–314) argues that "diversified, interlinked, land-based activities; folk agronomy involving measures with low land intensity and low (local and affordable) input regimes..." have been maintained by "traditional farming systems", including the applications of indigenous forms of agroforestry or periodic uses of certain vegetation belts. The protection of those ecosystems is not only essential for the preservation of watersheds and soils, but also for the reduction of natural hazards such as flooding, avalanches, land slides, or debris flows. It is therefore more than just an unwarranted demand and recommendation by scientists from "rich" countries when they are demanding as key themes for action to sustain the future of mountain communities and their environments:

- mountain-lowland interactions;
- sustainable agriculture and forest management and development;
- economic and technological changes and mountain communities;
- appropriate institutional arrangements.

Such and other recommendations (European Conference on Environmental and Societal Change in Mountain Regions: Global Change in the Mountains. Conclusions and Recommendations. Oxford, March 1998; edited by PRICE 1999) are almost necessarily of special importance to those fragile mountain ecosystems that are occupied by pastoralism and mountain forestry. In this context it should be clear that the demands of "sustainable agriculture" and "forest-management" alone are not enough. Experience shows that local farmers are well aware of ecological necessities. It is therefore essential that local, regional and national governments and their representatives understand and play their key roles in the implementation of these and other strategies.

In spite of the fact that the attention drawn to pastoral practices in the volumes or articles edited by MITCHELL & GUILLET (1994), STELLRECHT (1998), STELLRECHT & WINIGER (1997) or published by STEVENS (1993) and others are rather limited, it nevertheless holds true what Carl RATHJENS (1988, 140) stated: "The economy of high pastures belongs to the larger field of grazing and of seasonal migrations of man and cattle to high mountains. Therefore these facts have met with a growing interest in many mountains of the world, even though their importance for tropical high mountains is not yet fully understood."

Since this observation about a decade ago the study of pastoral practices has been incorporated into the research design of the "Culture Area Karakoram" (CAK) project of which results are presented in this compendium. In High Asia we generally observe a still important share of animal husbandry in the agricultural sector which remains to function as a basic needs provider although its share in contributing to the livelihood of mountain dwellers is decreasing. Connected with this is the perception that significant transformations occur in the field of land use strategies and the utilization of natural grazing. These changes can only be understood when seen in the wider context of high mountain economies. Therefore, research activities are rarely focused on the livestock sector alone. This statement holds true for the regional studies presented here.

5. AIMS AND FOCUS OF THIS COMPENDIUM

The investigations are challenging a developmentalist paradigm which governed the first four decades of development cooperation based on insufficient knowledge and expertise about local and regional conditions. Having made this state-

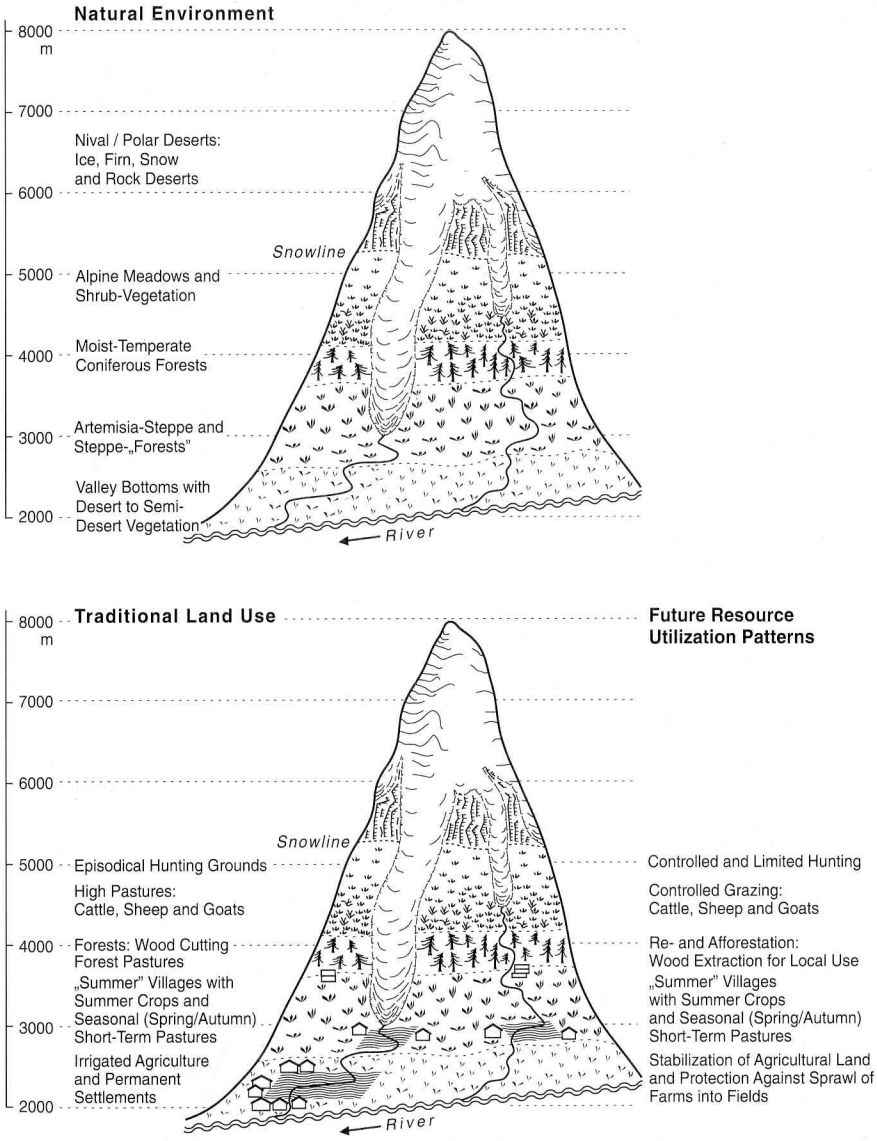


Fig. 4: Correspondence between physical environment, present land use and future resource utilization patterns

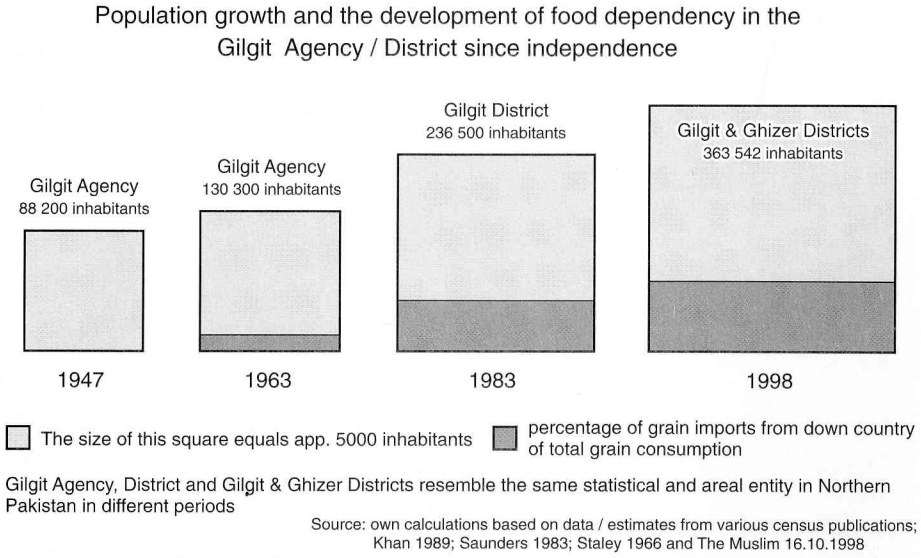
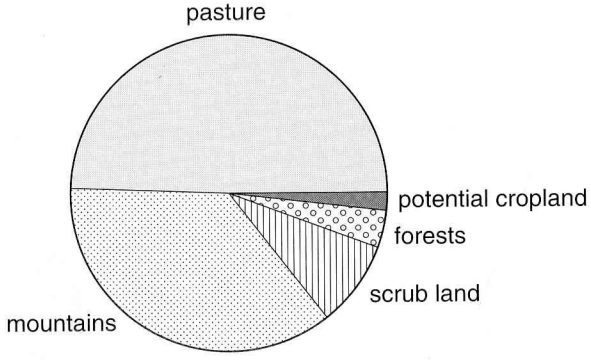


Fig. 5: Northern Pakistan: population growth and the development of food dependency

ment, the dualism of tradition and modernity is questioned as well as the modernization paradigm itself and a uni-directional path of development. Consequently popular linkages such as the interrelationship of population growth with land degradation and/or the unrestricted exploitation of natural resources have to be analyzed and discussed in the framework of socio-economic change. The impact of a changing accessibility through the provision of roads and motorable tracks is a key issue for the incorporation of peripheral mountain societies into the lowland economies and the world market. Dependency on local natural resources might be reduced or increased. Out-migration affects the consumer patterns as well as the population structure of the residents within the mountains. Exchange relations have undergone and are undergoing tremendous transformations and affecting the societal setup. With the advent of improved transport and communication systems – in the case of Pakistan the Karakoram Highway (KKH) stays as the symbol of such a transition – external agents of change appear on the scene in a new dimension. Public and privately sponsored economic planning and innovative measures have resulted in a wide spectrum of development activities under the banners of basic democracies, integrated rural development, community basic services programmes, local bodies & rural development, rural support programmes etc. In recent years their contributions and interferences have significantly altered the traditional exchange patterns between farming households and respective markets for their products and consumer demands. Socio-political developments such as transformations in the administrative setup, the extension of traffic and social infrastructure for the provision of basic amenities affect everyday life, the

organisation of households and the divison of labour (HERBERS 1998, HEWITT 1989, KREUTZMANN 1995b, MILLS 1996). The close interactions between harsh physical environments, increasingly unsustainable land uses and desirable potential forms of resource utilization are presented in Fig. 4 where ecological frame conditions are interpreted as a limiting, but not necessarily uni-laterally determining factor for human action.

Pastoral practices as introduced above have been affected and transformed in a similar manner as other fields of activity. Northern Pakistan has experienced this accelerated change since two decades (KREUTZMANN 1991, 1995c, STREEFLAND, KHAN & VAN LIESHOUT 1995). According to data from the population census offices the population has quadrupled since independence. Population growth continues and the dependency on external goods grows faster (Fig. 5). Nevertheless social and regional inequalities are tantamount to a complex pattern of socio-economic and market participation which cannot be explained by unifactorial correlations. Taking pastoral practices as the focus of attention the case studies shed light onto the overall dynamics of change in the high mountain regions of Northern Pakistan. According to estimates by the administrative authorities pastures cover nearly half of the available land (Fig. 6).



Source: Streefland, Khan & van Lieshout 1995, 83

Fig. 6: Land use differentiation in Northern Pakistan (Chitral and Northern Areas)

Institutions involved in rural development assess the requirement and availability of high pastures from previous estimates and observe a shift since the 1950s. The period immediately after independence is termed as a period when "pastures were still abundant" (STREEFLAND, KHAN & VAN LIESHOUT 1995, 85). The total number of livestock in the Northern Areas ranged around 1.12 million units of animal equivalents (equalling tropical livestock units) while natural grazing covered 3.6 million hectares (SHEIKH & KHAN 1982, 40–41). Cattle herds in-

creased by a quarter between 1970 and 1990, during the same period a decrease of sheep and goats' numbers of 12% was stated. The Pakistan Livestock Census of 1986 states for the Northern Areas an animal herd composition of: 408,056 cattle, 979 buffaloes, 642,645 sheep, 938,897 goats, 4,743 horses, 25,371 donkeys, 703 mules and 358,998 poultry birds (AKRSP 1991: 5). Although all figures are rather vague and based on extrapolations, livestock experts support the statement that in the meantime overgrazing or underfeeding has reached a quota of app. 30%. Acknowledging this, STREEFLAND, KHAN & VAN LIESHOUT (1995, 85) claim that "pastures do not seem to be irrecoverably damaged". They attribute the shifts to a "conversion of lower pastures and temperate range pastures into cropped land, which itself is used for house construction. ... The trend to convert low yielding pastures into high yielding cropped land is therefore a favourable one ..." (ibid., 85–86). "Average animal feed self-sufficiency has come down to a meagre 6–9 months. An increase in fodder trade is the logical consequence." (ibid., 91). The conversion of natural pasture into irrigated farmland is seen as a strategy to counterbalance this trend and to increase overall productivity besides providing alfalfa, clover, straw and plant residue to the livestock.

6. CASE STUDIES

The contributions presented in this volume attempt to investigate these interrelated patterns and changes in the production system. Without exception they are based on extensive field-work to provide insight into the complexities of resource utilization in the Eastern Hindukush, Karakoram and the Western Himalaya.

All practices of animal husbandry as introduced above – mountain nomadism, transhumance, and combined mountain agriculture – are to be found in the study area (Fig. 7). The latter is dominating the present period. Mountain farmers combine the natural resources made available for summer grazing in the high pastures with their all-season agriculture in the arid valley bottoms. Seasonal migrations of herds and shepherds are required to connect the different production zones. Substantial shares of the irrigated lands are reserved for fodder production (meadows, field parcels for alfafalfa and clover) and residue from crop cultivation supports the feed requirements of the flocks in addition. Mainly cattle are kept throughout the year in the homestead while sheep and goats as well as yaks are removed during the cultivation period. This form of combined mountain agriculture is to be found all over the study area in the Eastern Hindukush, Karakoram, and Western Himalaya and has replaced mountain nomadism in certain regions such as the Hunza valley (KREUTZMANN 1989, 1996, SNOY 1993). Mountain nomadism has become a historical feature there while we still find nomadic Bakerwal, Pashtuns and Gujur in the Nanga Parbat region, the Kaghan Valley and the Eastern Hindukush respectively (GRÖTZBACH 1989, 6, LANGENDIJK 1991, SCHICKHOFF 1993, 179–184). The Gujur people cannot be termed mountain nomads alone as some of them have settled down in the mountain valleys and follow a similar form of combined mountain agriculture as

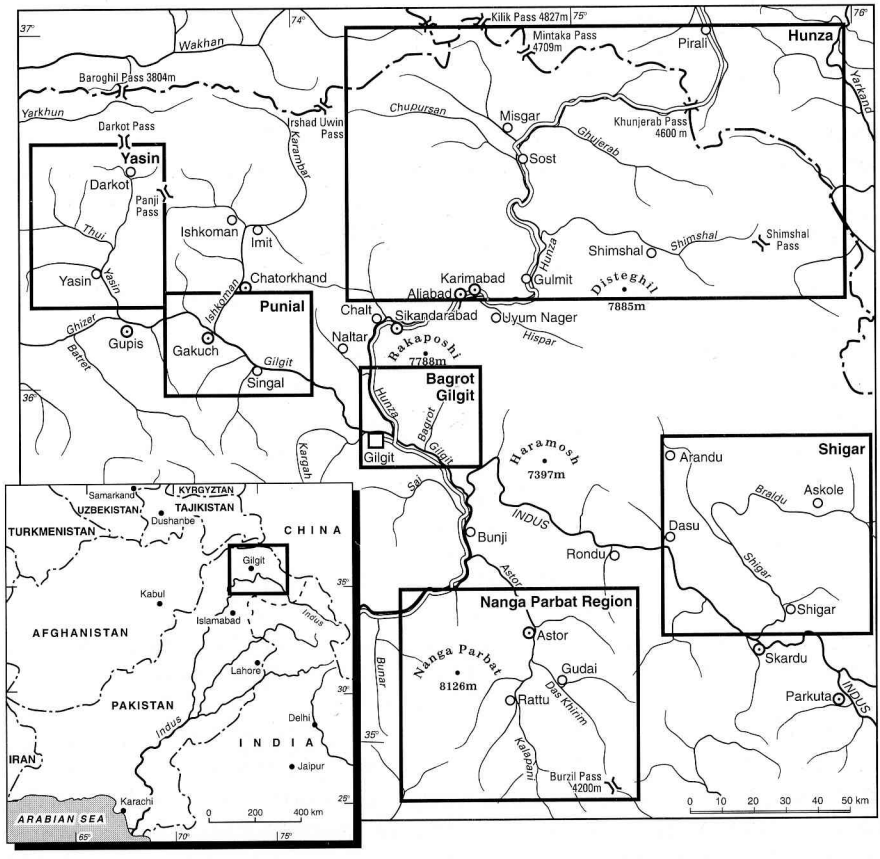


Fig. 7: Location of case studies

their neighbours. First Gujur migrations to the Ishkoman valley are recorded in 1910, other areas must have been visited much earlier. Some Gujurs have become shepherds for the local elite and afterwards their migrations resemble what has been described as transhumance above (BARTH 1956a, 1079–1089, 1956b, 76–78, JETTMAR 1960, 125, 129, KREUTZMANN 1994, 348, 1996, 257–262, LANGENDIJK 1991, SNOY 1965, 119–121, E. STALEY 1966, 334-344, J. STALEY 1966, 33–34, 96). Gujurs are mainly to be found nowadays in the western and southern part of the study area (Fig. 7). This brief discussion underlines the fact that regionalization of practices and their attribution to certain groups are obviously oversimplifying socio-economic activities which have been utilizing space differently and have been changing over time.

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