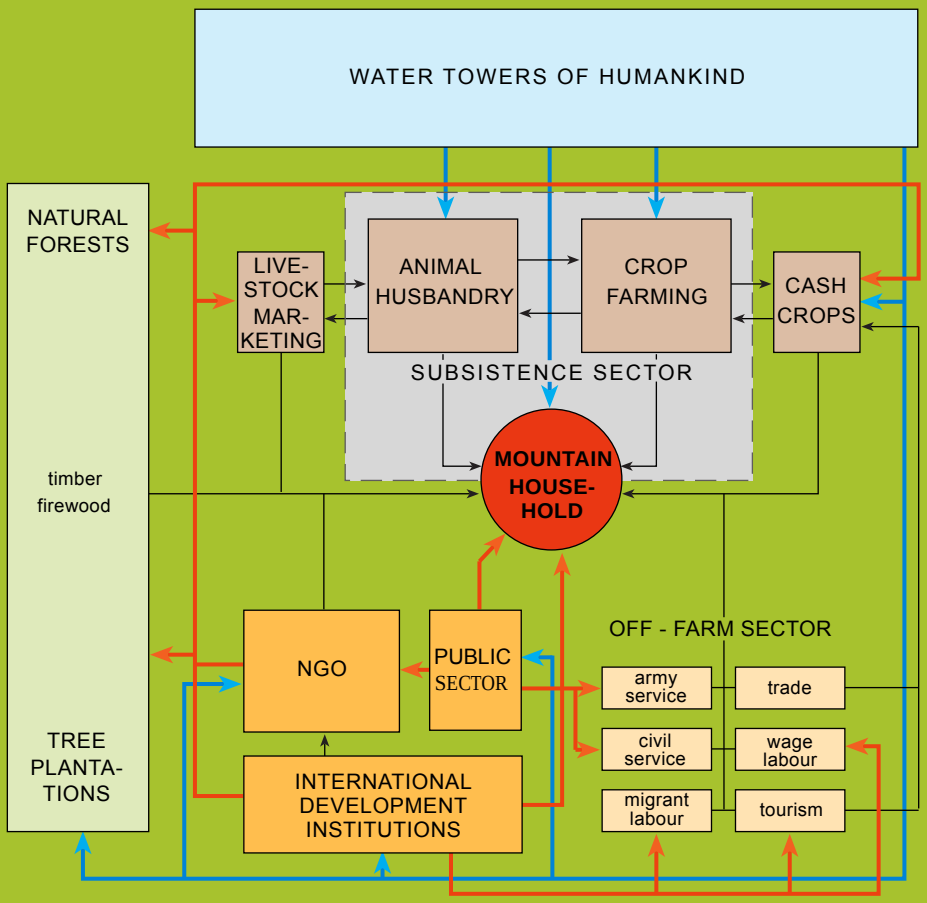
Occasional Papers Geographie 35

The Shigar Microcosm



Socio-economic Investigations in a Karakoram Oasis Northern Areas of Pakistan

Edited by
Hermann Kreutzmann
Matthias Schmidt
Andreas Benz

Zentrum für Entwicklungsländer-Forschung (ZELF)
Institut für Geographische Wissenschaften
Freie Universität Berlin

2008

Editor of Occasional Papers Geographie
Prof. Dr. Hermann Kreutzmann

Contact
Centre for Development Studies (ZELF)
Department of Geography
Freie Universitaet Berlin
Malterserstr. 74-100
D-12249 Berlin

hkreutzm@geog.fu-berlin.de

Tel: +49 – 30 – 838 70223
Fax: +49 – 30 – 838 70757

OCCASIONAL PAPERS GEOGRAPHIE

Heft 35

The Shigar Microcosm

Socio-economic Investigations in a Karakoram Oasis Northern Areas of Pakistan

Edited by

Hermann Kreutzmann

Matthias Schmidt

Andreas Benz

Zentrum für Entwicklungsländer-Forschung (ZELF)
Institut für Geographische Wissenschaften
Freie Universität Berlin

2008

PREFACE

Building bridges for mutual understanding

The report presented herewith is the outcome of a joint effort. Various parties have contributed to the materialisation of this project in which different partners cooperated for mutual benefit. Knowledge transfer requires the collection, generation and processing of data and their subsequent interpretation and presentation of findings. Consequently this report on the Shigar microcosm benefits from earlier scientific undertakings and academic projects aimed at an improved knowledge base and an enhanced understanding and interpretation of development processes and transformations in high mountain oases. Shigar is a prime example for the quest of increasing our knowledge.

Visitors to the region very often bypass Shigar on route to their quest for high peaks of the Karakoram which abound in the upper valley. Previous research efforts go back to colonial times when linguists and historians tried to gain a comprehensive knowledge of the culture and living conditions in the remote corners of the mountain belt. After independence scattered research projects were randomly executed. One of the more prominent efforts was the joint Pak-German Research Project “Culture Area Karakoram” in the early 1990s. During the multi-disciplinary programme sponsored by the Deutsche Forschungsgemeinschaft (German Research Council, DFG) Shigar became one of the target areas for a number of researchers. The nexus of research and implementation was emphasised on in the aftermath. Of great importance for regional development in itself became governmental and non-governmental activities aiming at improved infrastructure, education, health services, cultural heritage and economic enterprises. These activities have grown in recent years. In the framework of implementing development packages the need for background information and baseline surveys became ubiquitous. Planning without sound foundation is an awkward affair. Therefore all development agencies have devoted more efforts in recent years towards research and data gathering. Cooperation between academia and practice has become unavoidable and is fortunately growing.

This felt need was the driving force for the joint effort that was suggested by IUCN last year when a team from our research cell was invited to do a socio-economic survey of Shigar oasis. The Centre for Development Studies at the Freie Universitaet Berlin is part of the Geographic Sciences and in that capacity students are trained in executing fieldwork. Taking up the offer by IUCN we devoted and organised a two-semester course to prepare for fieldwork in Shigar and to evaluate the gathered data. The modest results of this undertaking are humbly presented herewith.

A project like this needs support and encouragement from a host of institutions. First of all, we are grateful to the International Union for the Conservation of Nature (IUCN) and its staff members who have prepared and managed the implementation of the exercise in great style and who have been helpful to our team throughout planning and working. In addition we were supported by the German Academic Exchange Service (DAAD), an institution which creates bridges for mutual understanding and supports students in both directions by supplying stipends and scholarships.

The Freie Universitaet Berlin and the Department of Earth Sciences sponsored the project and provided ample support in administrative fields. Especially in times when world politics are affecting international travel and academic exchange we have been grateful that this joint

project could materialise. In addition we enjoyed the company from students of the Karakoram International University (KIU) Gilgit and the National University of Science and Technology (NUST) in Islamabad during our stay in Shigar. Mutual learning and knowledge transfer becomes easier when personal dialogue is enabled and enhanced by sympathy and friendship. In Shigar we have found such a constellation. Other governmental and non-governmental institutions were supportive and our thanks go to the Raja of Shigar, the Assistant Commissioner, the representatives of Aga Khan Development Network and to the local interpreters, guides and resource persons.

A project like this is planned in offices, institutions and universities. Without the support, the hospitality and the by now long-standing friendship with citizens of Shigar we would not have dared to suggest such a research enterprise. Consequently this report is dedicated to the people of Shigar and we hope that it supports planning exercises and might even be useful as a reference work for future research and knowledge transfer.

Berlin, July 2008

Prof. Dr. Hermann Kreutzmann

Participants from the Freie Universitaet Berlin

Prof. Dr. Hermann Kreutzmann, Chair of Human Geography and Director of the Centre for Development Studies

Dr. Matthias Schmidt, Research Associate at the Centre for Development Studies

Andreas Benz, Doctoral Student at the Centre for Development Studies

Students:

Altenkirch, Rachid	Leimbach, Johannes	Schoger, Heinke
Bittner, Christian	Mahrwald, Susanne	Steinert, Julia
Bräunig, Lars	Maikowski, Tine	Voss, Franziska
Dieckhoff, Svenja	Methke, Danielo	Wächter, Tim
Guenther, Nadine	Michel, Christina	Wegner, Nicole
Höber, Johannes	Neutz, Sabrina	Wiemer, Stefanie
Koss, Christina	Paul, Daniel	Wrede, Malte
Landschulze, Jana	Piel, Sarah	

Content

List of Figures

List of Tables

List of Boxes

Annex A

Annex B

1. Land use in Shigar

Christian Bittner, Daniel Paul, Danielo Methke, Tim Wächter

1.1 Introduction

Shigar is located in the Central Karakoram, where the residents make a living based on a combination of crop farming and animal husbandry. Because of the high mountain environment and the arid climatic conditions reflected in sparse natural vegetation cover agricultural activities face significant challenges when survival on local resources is attempted. Previous investigations and studies have described the livelihood conditions and agricultural strategies adopted in the Shigar oasis (cf. SCHMIDT 2004a, b). The so-called combined mountain agriculture (EHLERS & KREUTZMANN 2000) applied here is similar to farming strategies which can be observed in the Hindu Kush, Karakoram and Himalaya (CLEMENS & NUESSER 2000; EHLERS 2000; HERBERS 2000; KREUTZMANN 2000, 2006; FAZLUR-RAHMAN 2007).
In Shigar, the utilisation of irrigated land plays an important role within the livelihood strategies of the local people. In our study we follow the question: “In which way did land use change during the last decade?” A comparison of previous research findings with the present situation was attempted and insights into recent developments in the local economy were expected. Thus, by dealing with this question one might derive information on the transformation of livelihood strategies of the inhabitants of Shigar. We subdivided the main research question into three sections including several sub-questions:

I. *Spatial structure of land use in Shigar Proper*: Did the area of irrigated land change? Is there any change in size and/or number of fields?
II. *Changes in agricultural land use*: Which are the main cultivars? Which cash crops are harvested? How much arable land is used for the cultivation of potatoes?
III. *Impact of animal husbandry on land use*: Are there any changes in the number of livestock? Did the use of high mountain pastures change in terms of intensity and/or frequency?

1.2 Methods and implementation

Field work in Shigar Proper was conducted between 31 March and 9 April 2008. In these ten days, mainly three approved geographical methods were used in order to collect empirical data: First, mapping of all irrigated land in Shigar Proper; second, conducting interviews with a number of farmers; third, systematic and structured observation of farming activities.
Mapping of land use was necessary for creating a land use map to compare the present land use patterns with the results of Schmidt’s work in 1997 (SCHMIDT 2004a). Hence, mapping was the main challenge and covered most of our fieldwork. A blueprint thematic map (with parcel borders, irrigation canals and settlement areas) provided the base map, originally drawn by SCHMIDT about ten years ago. For a better orientation in the field, a Quickbird satellite image from 2006 which existed for the same benchmark was consulted. As points of ref-

erence the location of big trees and irrigation canal crossings (best method) were used during the field work. Wherever these points could be localised in the base map, it was possible to start mapping from there on. Although the main focus was on agricultural land use, due to the versatile mapping key all forms of land use could be identified. Furthermore, a division or an amalgamation of parcels as well as gains or losses of cultivated land were drawn into the base map. The collected variables include the size of land in use, size and number of fields, types of land use and agricultural products (first crop).
Due to the term of our fieldwork in early April the sequential crops planted or sown later in the year are not represented in the map. Nevertheless, according to statements by local farmers we know that buckwheat, millet and maize are grown as second crops subsequent to barley or some varieties of wheat.
We carried out short qualitative interviews with farmers on the spot in the field area. Quantitative data were collected within the framework of the household survey, which was conducted by all members of the team. The variables include diversity of livestock and herd size, income from cash crops and recently introduced agricultural products.
While inspecting and mapping the fields we observed simultaneously field activities to gain a better understanding of the practiced agricultural system in Shigar. The qualitative and relevant variables collected for our study are practice of animal husbandry, agricultural products and forms of irrigation (inundation irrigation or furrow irrigation).

1.3 Results

1.3.1 Present state of land use in Shigar Proper

Land use in Shigar can be classified into three major types: settlement areas with orchards, cropland and irrigated meadows. The main settlement areas are located at the upper end of the Shigar oasis in the central east on both sides of the *nālā*. In this settlement belt, one can also find the administrative and commercial facilities of Shigar. Nevertheless, there are numerous smaller settlements scattered all over the oasis. All residential areas are surrounded by orchards (*tshar*). Those orchards are a diffuse category of land use. On the one hand they principally belong to existing settlements, but on the other hand they fulfill agricultural functions as there are many types of crops planted under the fruit trees, mostly vegetables and pulses.
The majority of irrigated land in Shigar is used as cropland. The largest consistent areas of arable fields are located north and south of the *nālā* and to the west of the core settlements. However, that does not imply that agriculture is of minor importance in the remaining areas of the oasis. On the contrary, almost every household is practicing farming to some extent, and cultivated fields can be found almost everywhere in Shigar.
The vast majority of field parcels are sown with wheat (*tro*), followed by barley (*nas*) and potatoes (*alu*). Vegetables and pulses are sparsely found on the open fields but they are cultivated frequently on small parts in the corners of wheat or barley fields. As already mentioned, they are also grown inside the gardens (Figure 1.1).

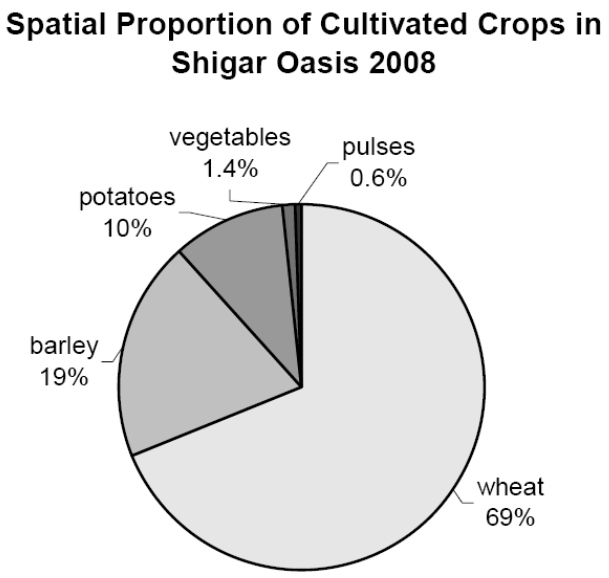


Figure 1.1 Spatial proportion of cultivated crops in Shigar Oasis 2008
Data: Mapping field work by Bittner, Methke, Paul & Wächter 2008

The minor importance of potatoes should be emphasized, because potatoes are, beside apricots, the most important cash crops in Shigar *(*Figure 1.2*)* while wheat, barley, pulses and vegetables are mostly produced for subsistence needs of the local households. Since potatoes are not spatially dominant, it might be concluded that cash crop production and market orientation of agriculture do not play a significant role in Shigar. This assumption is corroborated by the fact that vegetables and pulses, other "classical" cash crops, are only grown in small quantities only for domestic needs. Furthermore, according to our survey two thirds of all households do not sell any agricultural products at the market (Table 1.1).

However, there is a significant regional difference since the market-orientation in the UC Markunja seems to be more distinctive than in the UC Marapi. This assumption is also supported by comparing the crops' spatial shares in the two Union Councils. The share of potatoes in Markunja (12%) is twice as much as in Marapi (6%) (Data: Survey: Bittner, Methke, Paul & Wächter 2008).

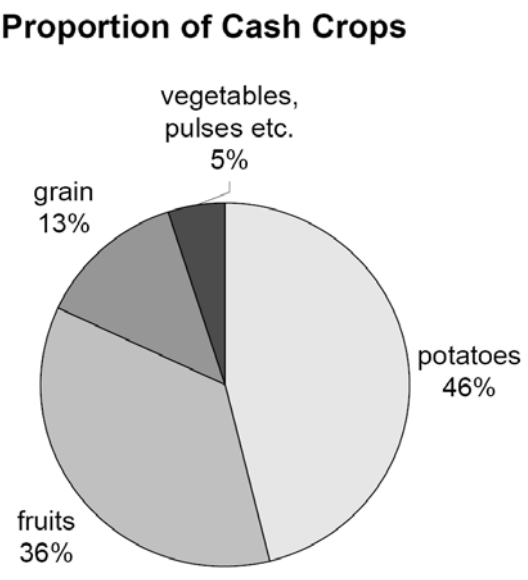


Figure 1.2 Proportion of cash crops
Data: Survey by FU Berlin Team 2008, n = 39

Irrigated meadows (*ol*) serve mainly as additional pastures for the livestock. These meadows represent the most extensive type of irrigated land in Shigar and they are basically located at the fringe of the oasis.

As displayed in Table 1.2 according to the household survey a household in Shigar Proper owns on average almost 11.85 kanal cropland, 2.81 kanal of orchards and 4.07 kanal of irrigated meadows. It should be mentioned that the significance of those numbers is limited, since there is a high range of cropland property per household in Shigar (from 0 kanal to 150 kanal). Land holdings of cropland and orchards per household do only slightly differ within the Shigar oasis while households in the UC Marapi own on average 6.9 kanal irrigated meadows in contrast to 1.59 kanal per household in the UC Markunja. This difference reflects the fact that large portions of land near the Shigar River in Marapi are

currently used as irrigated meadows while similar land resources in the north-western part of Markunja are neither subdivided into privately hold land parcels nor irrigated. This finding corresponds with our land use map *(*Annex A, Map 1.1*)* in which we classified these lands as barren land.

Table 1.1 Percentages of households selling agricultural products

Do you sell agricultural products?		
	yes	**no**
UC Markunja	45.5%	54.5%
UC Marapi	22.4%	77.6%
Total	**34.7%**	**65.3%**

Data: Survey by FU Berlin Team 2008, n = 124

Table 1.2 Mean land distribution per household

	Mean crop land per household (in kanal)	**Mean orchards per household (in kanal)**	**Mean irrigated meadows per household (in kanal)**
UC Markunja	11.88	2.17	1.59
UC Marapi	11.81	3.53	6.90
Total	**11.85**	**2.81**	**4.07**

Data: Survey by FU Berlin Team 2008, n = 124

Summing up, the irrigated land of the Shigar oasis seems to be structured according to a hierarchy of water supply. The settled areas have a priority due to household water demands and are located at the upper end of the canals next to the *nālā* in the central east of the oasis. The orchards, which have intermediate priority in terms of irrigation, are located next to the settled areas. The cropland, the predominant type of land use, is mainly located just below the settlement-orchard belt while the irrigated meadows have minor priority in terms of irrigation and can be found only at the fringes of the oasis, where the water supply can be rather scanty.

1.3.2 The cropping system

The cycle over the agricultural year in Shigar is similar to cropping systems in other parts of the Northern Areas. “Field preparation in spring, irrigation in summer and harvesting in autumn are the major tasks, which the farmers pursue during the three agricultural periods” (HERBERS 2000:123). But “the selection of suitable crops as well as sowing and harvesting times are entirely dependent on micro-scale weather conditions” (FAZLUR-RAHMAN 2007:125). In Shigar the cycle of the agricultural year starts as soon as the snow has melted with manuring the fields. In times of mild winters this can already happen at the end of February but usually field work starts at the beginning of March. The main agricultural work is done by hand by the farming households while ploughing is carried out with the help of cattle and yaks or by tractors at larger and well accessible fields.

Wheat is the first crop sown at the beginning of March. Besides the sowing tasks, the condition of the irrigation system is checked before the first irrigation, which usually takes place between the end of March and the beginning of April. After the first irrigation phase, generally women maintain the fields by weeding and collecting the weeds for their livestock (cf. chapter 7.3.7.) in order to brace the animals with fresh forage after the winter for the transfer to the high mountain pastures. Until the end of May, the fields are cultivated with potatoes, pulses and vegetables. Following the main duties of irrigation and maintaining, branches of trees are pollarded and buildings are refurbished. At the end of May and the beginning of June, the animal herds are driven to the high mountain pastures (cf. SCHMIDT 2004a).

In the middle of June, the first ripe fruits, mulberries, can be harvested. The first mature crop is barley and is harvested at the beginning of July. The farmers stated that nowadays wheat varieties with a short growing period are available that can be harvested at the same time as barley. The advantage concerning these new types is that a second crop could be cultivated on the fields (Figure 1.3).

During August the main duty related to agricultural work is the harvest of wheat which engages almost the whole population of Shigar. The grain needs to be cut and dried. Nowadays, the processing of the dried grain is carried out by threshing machines. At the same time, apricots are matured in the orchards. Depending on quality and amount, the apricots are sold or used for own consumption and either eaten, dried or fed to the animals. From mid August till mid September tradesmen arrive in Shigar in order to buy some cash crops.

After the harvest period, the first animals are transferred down from the high mountain pastures to graze the leftovers on the fields. September and October is the time to build up stocks for the upcoming winter period. Therefore the grass next to the fields and paths is cut and stored (cf. SCHMIDT 2004a).

October is the last month suitable for field work before winter in Shigar. During this month it is important to harvest the second crop, which is often premature and hence only used as fodder during the winter. The remaining animals are driven back from the high pastures and graze the final plants on the fields. Until the first snow, the animals pasture on the cultivated land and orchards in order to feed as much as possible before winter time. The farmers reported that with the end of the field work cycle the wedding season starts in Shigar. During the winter months, the agricultural duties are limited and the livestock remains in the stables.

Box 1.1 Market orientation and new agricultural products in Shigar Proper

Around 50% of the surveyed households stated that they have introduced new agricultural products on their fields in the past ten years. Thereby it is necessary to mention that approximately two thirds of all households in the UC Markunja and merely one third of the surveyed households in the UC Marapi introduced new products. This fact corroborates with Table 1.1 because of the stronger market-orientation of the households in the UC Markunja. Potato hybrids (36 mentions) are most popular among the recently introduced agricultural products, and they are mainly introduced in the UC Markunja. Different kinds of grain (e.g. barley or Chinese wheat) were equally mentioned but within the evaluation of the survey they were all grouped under the term "grain". The reason for the numerous mentions of grain is the availability of special Chinese wheat, which requires only three months of maturing time, allowing the cultivation of a second crop. Of some significance is the introduction of cherries, mainly in the UC Marapi, which were cultivated in Shigar only to a minor extent.

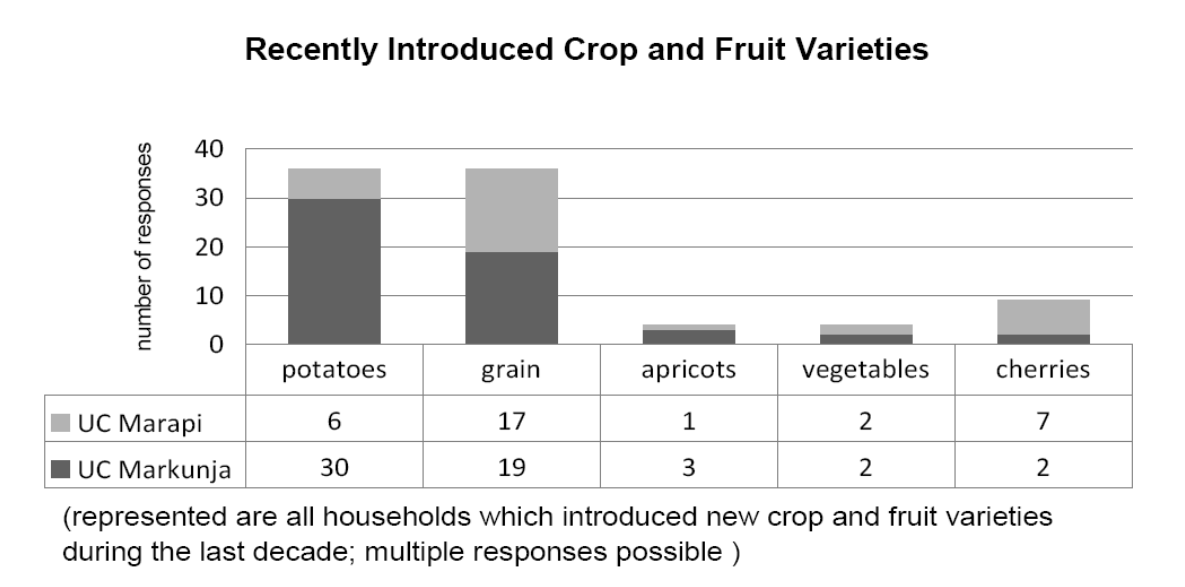


Figure 1.3 Recently introduced crop and fruit varieties
Data: Survey by FU Berlin Team 2008, n = 62 households

On average households earn approximately 4,000 Rs per year by selling agricultural products, with the striking difference that in the UC Markunja 5,500 Rs were earned per year whereas in the UC Marapi the income only amounted to 2,300 Rs. If only the crops and fruit selling households were examined, then the households in the UC Markunja and Marapi approximately earn 12,000 to 13,000 Rs per year. Therefore the regional difference only emerges because of the number of market-orientated households (Table 1.1).

1.3.3 Spatial structure of land use

By comparing the mapping results with the previous land use map of Shigar from 1997 (SCHMIDT 2004a), it was possible to derive certain conclusions about the spatial structure of land use, e.g. the size and number of field plots, their usage, as well as extensions or reductions of utilised land.

Many plots of the cropland have been divided into two and often even more smaller parts, which is the consequence of high population growth and existing inheritance practices. According to the conventional rights of succession in Shigar, land property is equally divided

between all sons.[1] This resulted in the fact that the land size per household decreases constantly and the field area becomes more and more fragmented: The average size of agricultural parcels shrinked from 2.4 kanal in 1998 to 1.5 kanal in 2008, which is a decrease of 36% in total. Simultaneously, the number of crop land parcels rose in that period from 4,420 (1998) to 7,088 (2008), which is an increase of 60% (Data: Survey by FU Berlin Team 2008). Those numbers clearly emphasize the ongoing fragmentation of the cultivated area in Shigar. The disadvantages of this fragmentation process are obvious: Below a certain field size it becomes unprofitable to cultivate a field plot, while the drawing of new borderlines between fields itself causes a significant loss of arable land. Moreover, the significant expansion of the built-up areas (chapter 2) leads to a loss of cropland and orchards. The built-up area in Shigar Proper expanded by 43% from 3572 to 5093 kanal between 1998 and 2008 (Data: Survey by FU Berlin Team 2008).

Another factor for both, a reduction and an extension of usable land is the Shigar River. On the one hand the meandering river has undercut the banks and destroyed 7 kanal of cropland in western Marapi, but on the other hand the river has accumulated and deposited sediments in Markunja and the southern part of Marapi, so that large areas can nowadays be used as irrigated meadows and even cropland.

Although the spatial distribution and proportion of land use in Shigar at first glance seem to be relatively statically, processes of land improvement and new land cultivation are prevalent. Farmers in Shigar try to improve and increase the utilized and usable land area: The built-up area, including orchards is constantly extended at the expense of the close-by cropland. At the same time, new cropland is taken under cultivation by transforming meadows at the fringes of the oasis into fields, which is a long and difficult task for the farmers. Wherever possible, the irrigated meadows are expanded into the desert by the construction of new canals on the accumulated banks of the Shigar River.

1.3.4 Impact of animal husbandry on livelihood

Animal husbandry is the other pillar of the combined mountain agriculture which is performed all-over Baltistan and in neighbouring Karakoram valleys as well. There exist several interdependencies between crop farming and animal husbandry. On the one hand, livestock produces valuable manure for fields and gardens.[2] On the other hand, crop farming provides straw and fodder for the animal herds to sustain their survival in the stables during the winter time. Furthermore, yaks, *zo* and bulls are used for ploughing and threshing purposes (cf. SCHMIDT 2000). The significance of animal husbandry for the resident population is equipollent (milk, meat, wool and skins, dung for heating, etc.). In contrast to Basha and Braldo Valley, animal husbandry in Shigar Proper can be described more as a contribution to subsistence agriculture than as a source of cash income (SCHMIDT 2004a:88).

[1] Concerning the differences between Islamic rights of succession and local customs see chapter 7.

[2] On newly cultivated acreage nutritious humified soil has to be developed and only leguminous plants, grasses and bushes grow in the initial phases. The livestock grazes these and simultaneously provides animal droppings to the fields and thus contributes manure to the formation of humus soil bed. It can take up to ten years according to farmers' estimations until any grain crops can be planted on the newly cultivated fields.

The average number of animals per household decreased in comparison to the year 1997 (Figure 1.4). On average, one household maintains 16 animals in Shigar Proper. The distribution of animals shows the similar tendency of the past: In the UC Marapi, the average of animals per household is much higher than in the UC Markunja which reflects the fact that summer pasture areas of Marapi are much larger than the summer pastures of Markunja. In general, "the herd composition varies with the regional fodder potentials which depend on the variation of the vegetation cover and cropping patterns" (CLEMENS & NUESSER 2000:161). Goats present the largest group of animals kept by the households of Shigar because they are very well adjusted to the scarcity of fodder in the harsh environment of the Central Karakoram, and they accommodate their owners with milk. Sheep represent the second largest group, but their number increased in comparison to the year 1997 (cf. SCHMIDT 2004a).

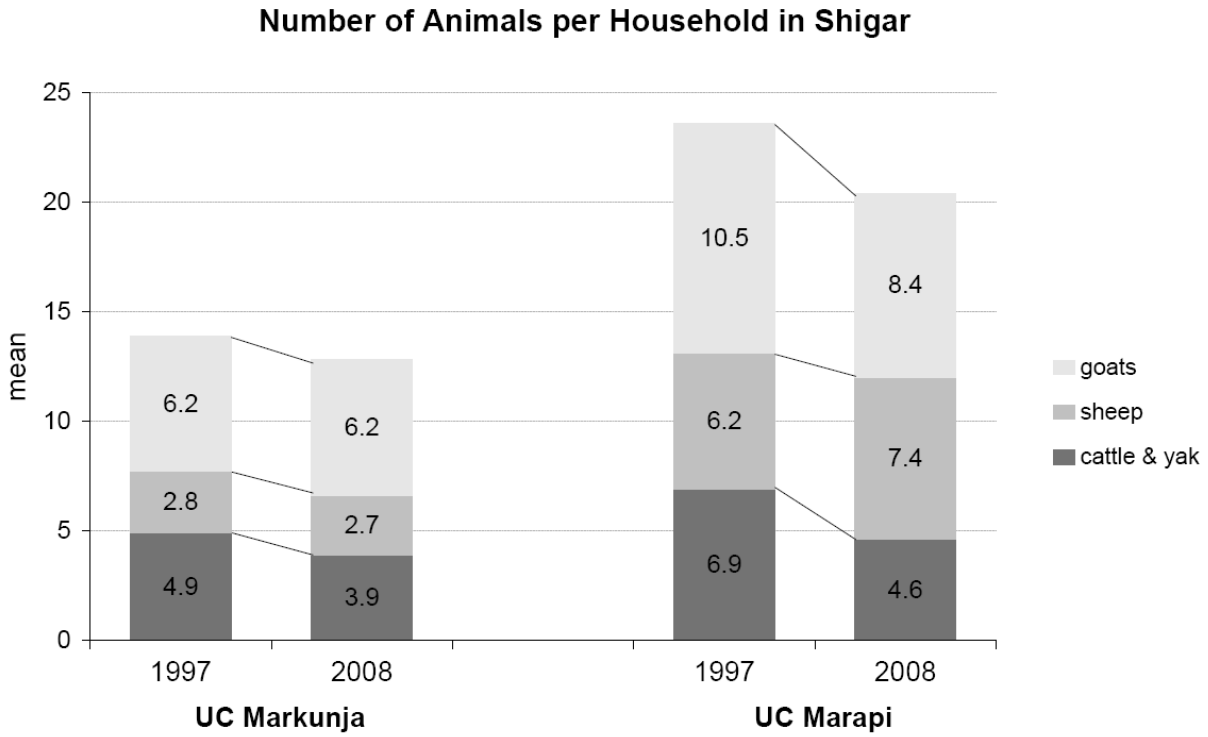


Figure 1.4 Number of animals per household in Shigar
Data: Survey by FU Berlin Team 2008, compilation based on Schmidt 2004, n = 123

The number of cattle such as yaks, bulls and *zos* has decreased explicitly. This was forced by the increasing use of tractors and threshing machines. We observed that several tractors are used for ploughing, especially at fields located near to roads. Hence, the number of cattle working in the fields decreases. A further reason could be the high demand of fodder for cattle, because the herd sizes are highly limited by the basic necessity of feeding the animals during the winter months. Very few households have enough land to produce adequate forage for a large number of animals (cf. SCHMIDT 2004a).

The results of the household survey show that nearly all of the interviewed persons send their animals to the high mountain pastures (*bloq*, *lungma*). After sowing in spring, the animals have to be kept away from the cultivated fields. Otherwise they would destroy the fields and growing plants. During spring time, as we could observe, the flocks of sheep and goats stay on the *ol*-areas next to the settlements or near the river all day. They are permanently

herded by a member of the village community. In case this rule is infracted, the owner is sanctioned for the damage the animal has caused. The animals are held on high mountain pastures during the summer months by a certain number of villagers who are responsible for all activities linked with animal husbandry. In total, 80% of all households with livestock are personally involved in animal husbandry for a certain time. Only one fifth of all households remunerate shepherds for keeping their livestock. Already ten years ago, SCHMIDT (2004a:36) remarked that the herb- and grass-covered steppes as well as the rich high pastures are intensively grazed by the livestock during the summer. These areas above the arid valley floors are an essential part of the local survival strategy. Today, according to three quarters of the interviewees, the importance of animal husbandry for the household incomes is even increasing.

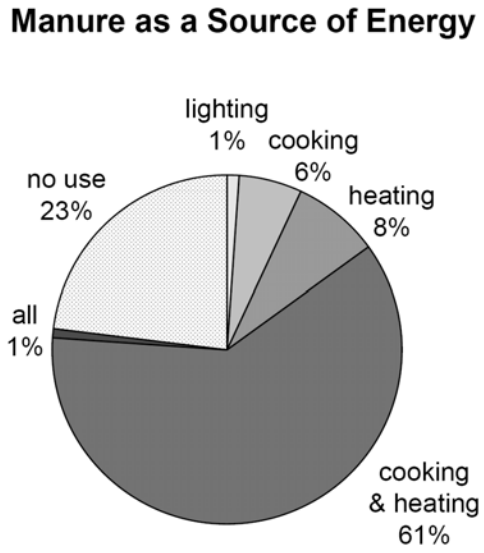


Figure 1.5 Manure as a source of energy
Data: Survey by FU Berlin Team 2008, n = 123

Beside the significant importance of animal husbandry for the subsistence economy and to gain additional income, it is part of the metabolism in the system of the high mountain economy (cf. CLEMENS & NUESSER 2000). One aspect is the cultivation of new field parcels with the help of animal manure; another is the additional fertilisation of the fields in spring time. Animal dung as a low-price energy source is also a common use for numerous households. The droppings of the livestock are collected and dried and the resulting product is a solid fuel for cooking and heating, used by more than three quarters of the households (Figure 1.5). Only one fifth of all households do not rely on dung as energy source (cf. FAZLUR-RAHMAN 2007:156).

1.4 Conclusion

The traditional livelihood system of the combined mountain agriculture, this greatly harmonised combination of agriculture and livestock farming, is still practiced in Shigar today. However it is not the only and outstanding pillar for the generation of income anymore. A constantly growing population has already left it's footprints in the land use patterns of Shigar: the built-up area is growing and as a result the parcels of the cropland are shrinking and fragmented. Although new land is taken under cultivation, this process takes too long to guarantee every person enough fertile land to secure a livelihood based on agriculture. Thus, income must be generated in different ways. The option of planting cash crops (i.e. potatoes) on the fields for a higher income does not seem to be too popular among the inhabitants of

Shigar. In account of this there must be a huge share of people who work at least partly in non-agriculture sectors in Shigar or abroad.

2. Built environment: changes in the Shigar Oasis

Christina Koss, Johannes Leimbach, Christina Michel, Heinke Schoger

2.1 Introduction and research concept

Culture is not a singular element, but a composition of many details. Buildings are one major representative of culture, including landmarks as well as settlements. Due to buildings, it is possible to tell important things about history, but also about the present livelihood situation of families.

The Shigar valley has been faced with a rapid development since the opening of the Karaoram Highway. The upgrade of the main road to Skardu was completed in 2003 and has effected the hamlets' character, namely through a profound impact on all different aspects of collective life and eventually also on the built environment, too. Traditionally, people lived in dense nucleated settlements consisting of houses constructed of local material around the main water canals (cf. IUCN 2007). However, nowadays the traditional live-patterns are changing including a deterioration of conditions in human settlements and built heritages (cf. AKTC 2005).

Our research deals with the built environment and trends in construction activities, i.e. old buildings decay and new houses are constructed on agricultural land. The major task was the acquisition and mapping of the existing buildings in the Shigar oasis. The principal challenge was to analyse in which way and to what extent the built environment in Shigar has changed over the past ten years. For the analysis Schmidt's findings in Shigar from 1997 conduced as references (cf. SCHMIDT 2004a).

The key objective of the study aims to analyse, if there is an extension of the settlements and in connection a deterioration of the traditionally narrow cropped settlement core (Figure 2.1). This was investigated by surveying and mapping the existing buildings in Shigar.

Our survey included several sub-questions in order to achieve more differentiated results. Attention was laid on the inhabitants' motivation for new housing constructions and their selection criteria for the new settlement area. The research aims to answer the following questions: Can a change be observed relating to (traditional) house types and if so, to what extent? Is there a use of new building materials? If so, can the social structure be derived from building materials and the construction activity? The traditional building materials and different house designs in Shigar valley were portrayed as Balti style, based on a study of DAINELLI published in 1924. The traditional house type in Shigar is rather big and usually constructed with sun-dried adobe blocks (cf. DAINELLI 1924:54). The common Balti style is characterised by local building materials found in the immediate environment. The ground floor, traditionally used in winter as living room and stable for the animals, is built of rocks and has no windows. In contrast, the upper floor was used as summer residence and is constructed of sun-dried blocks and timber. The staircase to the upper floor derives from social status and therefore varies from a solid stonewall to a simple ladder (cf. DAINELLII 1924:66).

Figure 2.1 Old settlement core of Chhinpa
Photo: Michel 2008

The main hypothesis in this fieldwork assumes that "traditional settlement patterns offer potential answers to growing population and urbanisation pressures" (AKTC 2005:59). Today, these traditional settlements are faced with changes. "The effects of education, migration, trade and tourism have slowly led to discernible differences in income, social attitudes and consumption patterns" (AKTC 2005:53). These effects also influence the built environment because as a consequence people modernise their lifestyle. The "government's sponsoring of infrastructural development projects of roads, schools, clinics, (…) [and] municipal buildings" introduced innovative construction methods but also new styles and building materials to the area (IUCN 2007:7).

2.2 Methodology

Various empirical research methods were applied, i.e. firstly the mapping of the contemporary built environment of the two Union Councils Markunja and Marapi in order to capture a general idea of the present situation. Maps were drawn in the field on the basis of a Quickbird satellite image and the Shigar map by SCHMIDT (2004a, b). Subsequently, the maps were digitised to process the data in a GIS data base. Buildings were digitised individually, as far as possible. However, buildings constructed nearby in quarters were combined to one area. Several GIS layers were produced to visualise the geographical distribution and the functional dimension of the built environment in the Shigar oasis. Based on the mapping the analysis of the development in comparison with Schmidt's findings from 1997 was enabled. Additionally, 42 households were surveyed with a standardised questionnaire in order to get

a deeper insight into their personal circumstances and living conditions. A range of these answers as well as an analysis of the general household survey can be found in chapter 3.2. Furthermore, based on an expert interview with the project manager of AKCSP in Shigar, Mr. Abbas Ali Shah, helpful background information including the mission and vision of AKTC was gained.
The following chapters display the findings and the analysis based on our research concept and aim to answer the raised questions.

2.3 Built environment of Shigar

The following extract from the complete map (Annex A, Map 2.1) displays the hamlets located south of the Shigar side valley stream (nālā) in the border area of the two Union Councils Markunja and Marapi. Figure 2.2 demonstrates the actual status of the built environment in the Shigar oasis. This GIS layer is (in reference to the field work of SCHMIDT in 1997) an update of the built environment situation in Shigar. The marked areas allow a comparison of the contemporary ratio of cropped and cultivated land with the situation Schmidt was confronted with a decade ago. Evidently, the development of the built environment proves an expansion of the settlement account of former agricultural land. In short: cropland is receding.

Status of the Built Environment in Shigar (Extract)

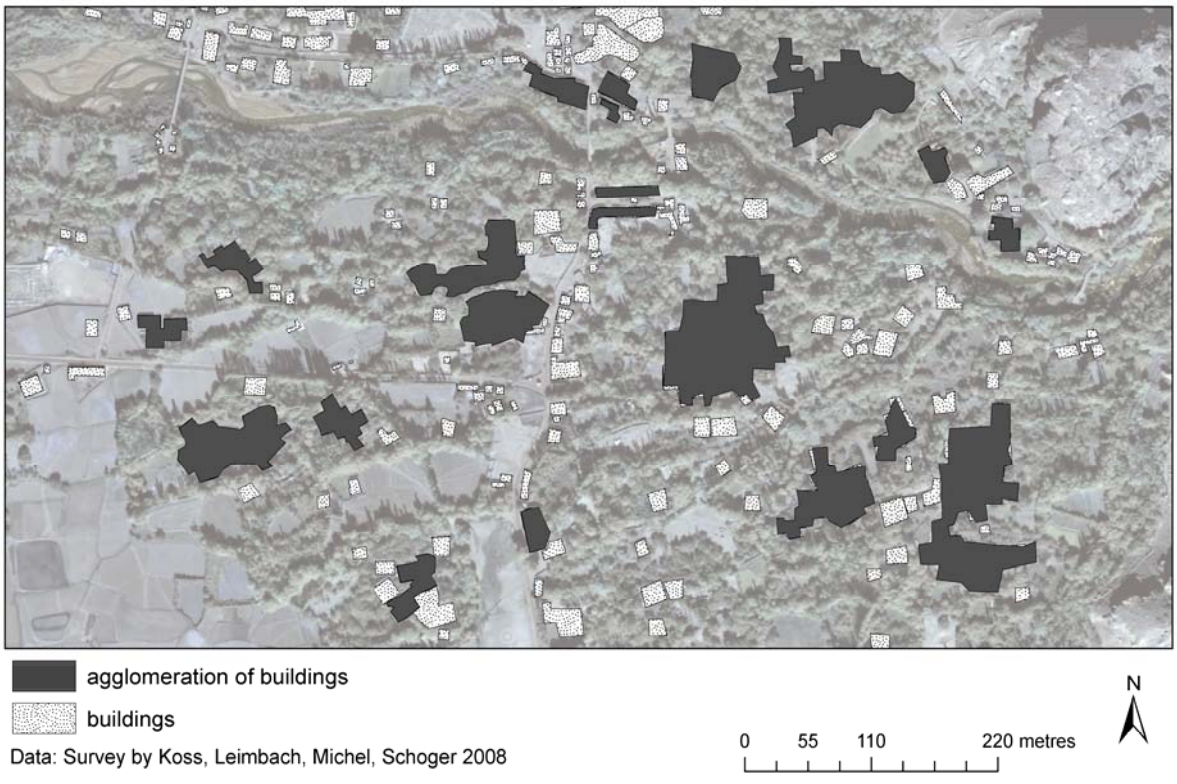


Figure 2.2 Status of the built environment in Shigar (extract)

The hamlet Kyahong, which is located in the western part of Shigar Proper, is a representative example concerning changes of the settlement area. Henceforth the case study Kyahong will be used to explain the ongoing development in the Shigar oasis on the local level. The fieldwork allowed defining an old settlement in the centre of this hamlet. The houses in the centre of the settlement are the oldest ones. In proximity to the centre but still inside the

boundaries identified in 1997, younger, middle-aged buildings can be found. The latest houses are located at the margins of the agglomeration. Due to this example it becomes clear that the prior orchards have been partially transferred into built-up areas, especially land located close to the unmetalled ring road (Figure 2.3). The vicinity to the road and thus, access to the communication infrastructure seem to be a significant aspect for the house owners concerning their choice of the settlement place. The construction of new houses outside of the densely populated settlement core and thus the spatial expansion of the built-up area in Kyhong is typical for almost all hamlets of Shigar Proper.

Kyahong: From Compact to Scattered Settlement

.

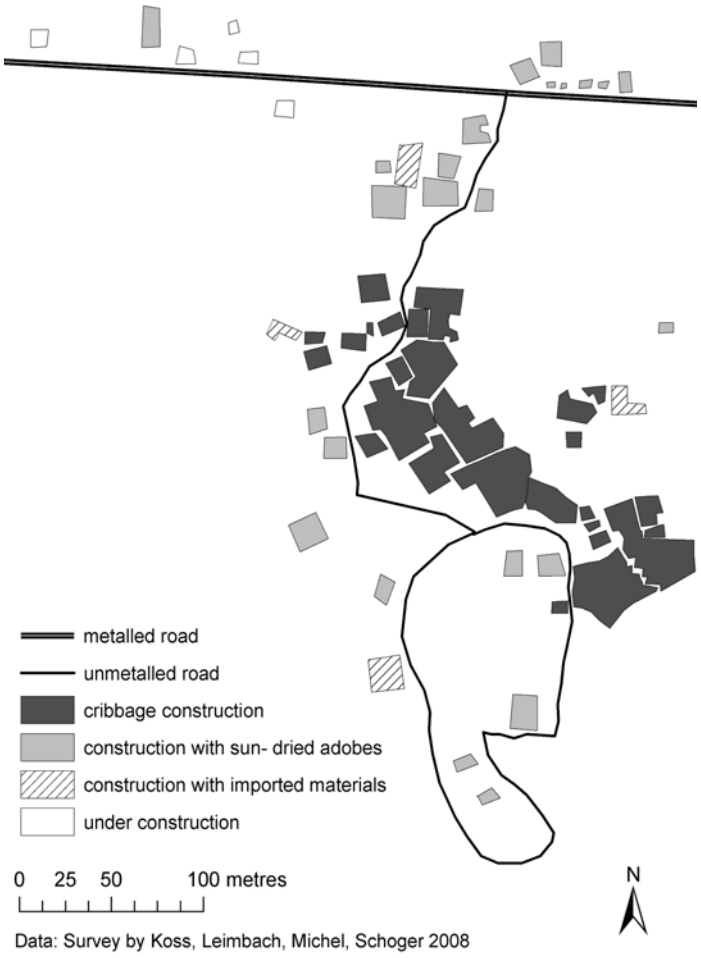


Figure 2.3 Expansion of the settlement in Kyahong

Annex A, Map 2.1 shows the geographical distribution of the built-up area. The main ag-glomeration of buildings can be identified at the central east of the Shigar oasis including the hamlets Shopa, Agepa, Ghzoapa, Bontopa, Astana, Chimaqpa, Chhinapa and Halpapa. Obviously these hamlets, all of them appear to be close-knit scattered settlements, possess the highest conglomeration of buildings in the Shigar oasis. They seem to form a sort of centre located and arranged around the Raja Fort. This central part around the Shigar Fort is presumably the oldest part of Shigar, though the derivation is unknown and widely discussed (cf. SCHMIDT 2004:74).

However, based on the geographical distribution the functional dimension of the buildings does not necessarily become clear. In order to visualise the diverse utilisations of buildings in the Shigar oasis, a GIS layer of the functional dimension was created and the buildings divided into the following categories (Annex A, Map 2.2): *commercial*, *residential*, *public* and *religious buildings*, e.g. *imambara*, *mosque* or *madrasa*. Furthermore watermills, where distinguishable, as well as cemeteries have been mapped and digitised. Additionally the categories *dismantled* and *demolished area* describe the specific situation of the built environment. With the exception of Bloqkhor, dismantled areas within the settlement cores are exclusively present in the south of the Shigar oasis, e.g. in Gyanpa, Blaqchan, Mashunpa, Marapi Bala (Gongma Marapi), Hilamdrong, Kothang Bala, Malakhor and Drong. The reasons for this tendency can only be assumed.

The central hamlets Shopa, Agepa, Ghzoapa, Bontopa, Astana, Chimaqpa, Chhinapa and Halpapa exhibit not only the central agglomeration of buildings but also the highest accumulation of different functional aspects. Commercial buildings such as shops and commercial areas of craftsmen, public buildings, e.g. schools and hospitals as well as a high number of mosques and *imambaras* are located in this area.

The case study Kyahong displays the range of various functions on the local level (Figure 2.4). In the northern part of this hamlet, alongside the metalled road, a small commercial area is situated, probably for practical reasons of goods transport, while recently built public buildings such as schools (coloured in black) are located in the western and eastern periphery. The religious buildings, i.e. one *imambara* and two mosques, are constructed at the edge of the old settlement core.

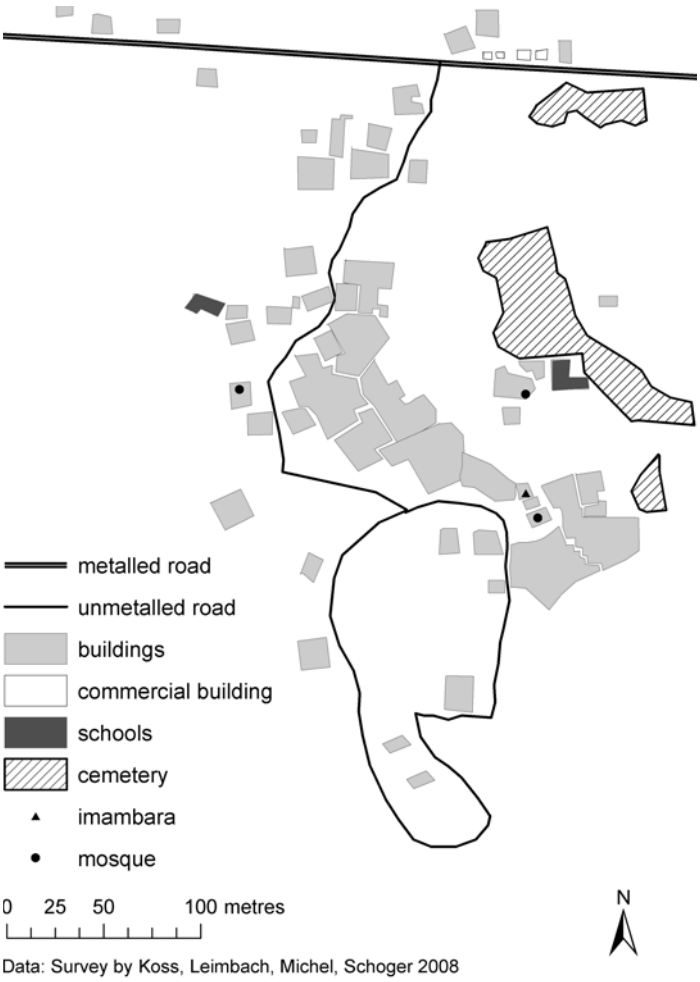


Figure 2.4 Functional structure of the habitat Kyahong

House types

*"The villages are in clusters of little stone huts [...]. Most of the huts are diminutive, with rooms only eight or ten feet in diameter and an entrance door two feet wide and two-and-a-half feet high. In the lower rooms one can barely stand up, but there is a notched pole used as a ladder to an upper room which is less cave-like. Many of the upper rooms are made in wattle, sometimes plastered over with clay. The mosques are of similar construction to the houses, but of more woodwork, large front verandas, and much beautiful ill-finished carving." (*NEVE *1913:165)*

The citation gives an impression of the settlement structures and edificial equipment travellers found in the Karakoram area in the early 20th century. In contrary, this chapter deals with the houses found in Shigar at present time. Furthermore, potential changes of building materials and interior space of the buildings are elaborated, followed by the attempt to deduce a relative chronology.

Architectural features in northern Pakistan are regarded as "highly complex in their cultural origins, being informed by the diverse cultures of Tibet, Ladakh and Kashmir" (AKTC 2005:54). In Shigar, three different types of houses were classified in regard to their building materials. House Type I is characterised by a so called "cribbage construction", for House

Type II predominantly sun-dried adobes are used. House Type III, which can be regarded as latest and most "modern" type, consists of imported building materials such as iron and steel.

House Type I: Cribbage- Construction

Houses that are constructed in a so called "cribbage" way, a complex timber box work, turn out to be a rare sight in Shigar despite obvious advantages. Cribbage constructions (Figure 2.5) provide some flexibility, which helps to resist uplift forces that might occur during earthquakes. Furthermore the structure and the walls of this house type are stabilised by horizontal "cators" and reinforcements of timber beams in the corners. Accordingly, a redistribution of loads is possible, channelling forces away from weak spots and providing corner rigidity (for further details see AKTC 2005:17-18; HUGHES & LEFORT 2006; HUGHES 2005; MASOOD KHAN 2006). The foundations are roughly formed of debris stones and usually no wider than the walls placed above. The upper floor traditionally comprises of wattle, supporting ventilation in hot summers (cf. Schmidt 2004:74).

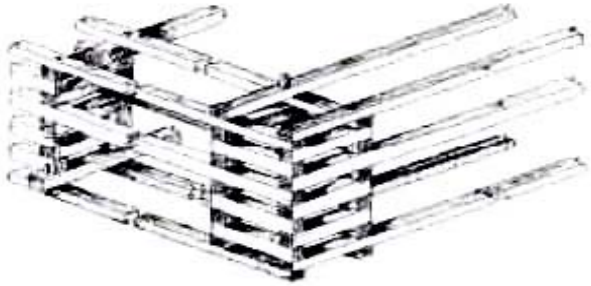


Figure 2.5 Abstracted sketch of "cribbage construction"
(AKTC 2005:17)

Figure 2.6 Mosque in Shigar with cribbage construction including delicate wood carvings
Photo: Michel 2008

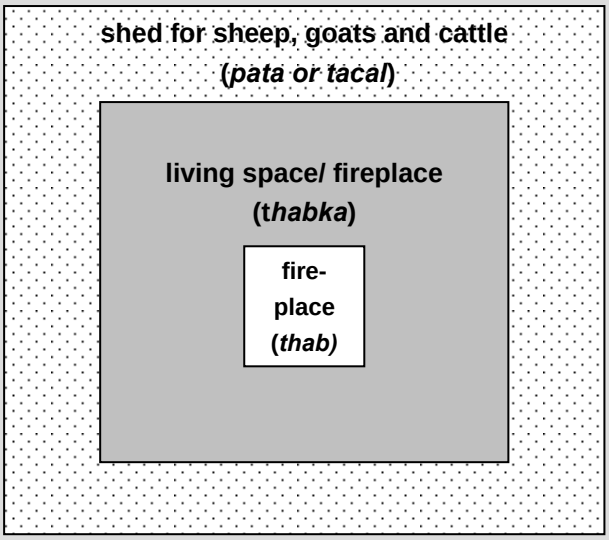
Non-load bearing walls are often made of sun-dried adobes or daub-plastered wattle. The mostly two-storey, in rare cases also three-storey constructions shelter cattle in the ground floor, where the *katsa* (see textbox for detailed information), the traditional Balti winter room, is also situated. The first floor is occupied by the human inhabitants.

Nowadays cribbage constructions are almost exclusively visible in mosques, often featuring impressive delicate wood carvings (Figure 2.6).

As house type I is regarded chronological oldest, it is found predominately in the settlement cores, the oldest parts of the hamlets and villages. Houses that are not stringent constructed in a cribbage way, but made in a modified form by using less timber, have also been classified as house type I, since they also date older than buildings of the more common and younger house type II. Irrespective of the age, residential houses that belong to this category are found only infrequently and are often in a bad condition.

Box 2.1 The katsa – old-fashioned relic or meaningful necessity?

The *katsa* is an essential element of traditional houses in northern Pakistan. The windowless winter room located at the ground floor is the place, where people and cattle spent the winter together. The main living room of the *katsa,* the *thabka,* is centrally located around the fireplace (*thab)* and the place where cooking and socializing predominantly occur (Box 2.1/a).



a) Ground plan of a *katsa*
Design: Michel 2008

b) Interior of a *katsa* in Kyahong
Photo: Michel 2008

Divided by narrow wooden enclosures, the *thabka* is surrounded by stables for cattle, sheep and goats (so called *patals* or *tacals).* Below the ceiling and on the walls storage space is provided by often ornamented racks, which do not only store the personal commodities but serve as an accommodation for the most vulnerable animals such as lambs and goatlings, too. Fresh air and light is provided by an opening in the roof, the so called *khar khong*, which also forms the entrance for the inhabitants who enter via a ladder. The cattle enter through a separate at-grade doorway. The often opulent ornamented rooms (Box 2.1/b) feature a very high energy efficiency, which is achieved through the close coexistence of cattle and human inhabitants. Situated at the lowest level of the house and surrounded by cattle pens, it is warmer than other parts of the house.

c) Impressive wood carvings on a beam in a *katsa* in Kyahong
Photo: Michel 2008

Besides the high energy-efficiency, nowadays *katsas* are often regarded backwardly. They are often smoky and dark because of only one opening in the roof, mostly resulting in an insufficient fume outlet and suboptimal exposure to light as well as causing serious respiratory diseases. As a result, people leave their traditional houses in favour of new houses, resulting in a loss of not only architectural treasures but also traditional lifestyle. Even though only few people in Shigar possess a *katsa* today and even less still use them, there is a number of people, who become aware of the qualities of the *katsa*. Despite having already built a new house, they return to their *katsas* in severe winters.

The vast majority of houses in Shigar is made of clay bricks, respectively sun-dried adobes. The construction, even though similar in layout and material, features a great variation – apparently every house of this Type II is unique. The form of construction depends on the topography, the size of the household and, increasingly, on the wealth or the social status of the owner. The house can be one- or two-storey, plastered or un-plastered and also the use of wall paint is erratic, although obviously white wash is preferred as commanding colour for the external walls.

Commonly, for the vast majority of houses timber is only used for the separation of floors. Despite being predominately erected by sun-dried clay bricks, the rare use of timber is possibly a result of the small timber resources of the area.

Nowadays, many houses undergo rapid changes, and walls made of wattle and daub since long times are now replaced by walls exclusively made of clay bricks (Figure 2.7). While in former times windows due to higher energy-efficiency were rare and small, big glass windows, often with painted frames, occur today. Whereas in the past the traditional Balti house (*nang*), was entered by an entrance hole in the roof or on the first floor, in present times doors in the ground floor are frequent. Regarding the function of the different floors, the ground floor, if two-storey, is not necessarily used for cattle anymore. Cattle sheds attached to the house seem to be more common nowadays. The ground floor serves now as additional living space for human inhabitants.

Figure 2.7 Construction stages of a building made of sun-dried adobes
Photo: Michel 2008

The earlier mentioned typical flat roof made of wooden beams, poplar twigs and clay is used as working and bin locations during summertime, even though the use is hazardous (cf. SCHMIDT 2004:75). Clay made flat roofs are extremely moisture-sensitive and in case of heavy or long-lasting rainfall the roof might even collapse.

As buildings made of sun-dried adobes are the most common houses and often built on or around older houses, they occur everywhere in the Shigar oasis and do not seem to follow a certain pattern of spatial distribution.

House Type III: Houses of imported materials

House Type III, which can be regarded as latest and most “modern”, consists of imported building materials such as iron and steel. This type is always one-storey and often plastered and painted in bright colours (Figure 2.8). The entrance area is not only marked by a door,

but often glazed and strongly decorated. The flat roof, a last reference to traditional buildings, is often covered with corrugated sheets, which clarifies the change of utilisation, too.

Figure 2.8 "Modern" house in Shigar
Photo: Michel 2008

When cattle sheds are existing, they are mostly situated afar the house in a separate building. The construction of houses of imported materials is reserved for richer people, as the materials are more expensive than local building materials.

Whereas the oldest and middle-aged houses of house types I and II are mostly located in or around the settlement core, houses made of imported materials are often found in previous orchards located in the periphery of settlements or even more distant.

2.4 Construction activities in Shigar

As already mentioned above, the study included a standardised questionnaire solely regarding the built environment of the Shigar oasis, as well as a general questionnaire of the household survey used by all research groups, which partly covered questions concerning the built environment, too. The preliminary results of the analysis of both questionnaires are displayed below.

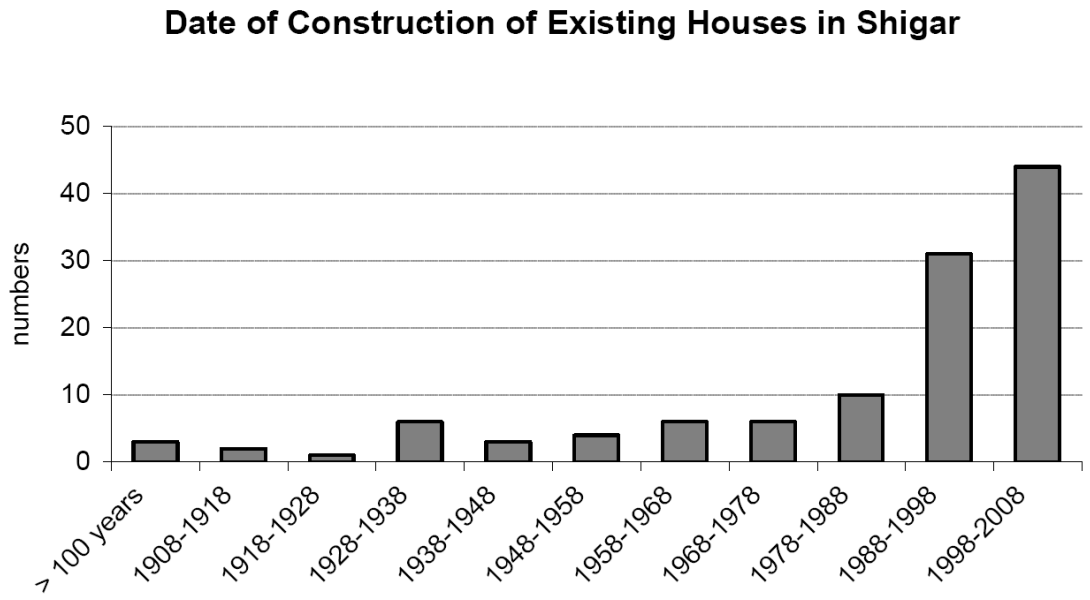


Figure 2.9 Housing construction during the last century in Shigar
Data: Survey by FU Berlin Team 2008, n=116

The universal set of the general questionnaire consists of an overall data record of 124 interviews. Aspects such as the age of houses, number of floors and number of rooms (respectively the number of living rooms, kitchens, bathrooms and storage rooms) were enquired in the general questionnaire in order to resort to a broader sample of answers. Be-cause of eight invalid cases, an overall of 116 cases was evaluated and interpreted. As newly built houses are an indicator for the change of the settlement structure and the built environment,

a closer look on the age of the houses is necessary. As Figure 2.9 indicates, a significant increase of construction activities has taken place especially in the last two decades.
In order to achieve a more practicable utilisation of the data, five categories are identified:
Category A represents very new houses that have been built throughout the last ten years. **Category B** includes houses which are between 11 and 20 years old. The following **Category C** has a larger timescale and covers houses among the age of 21 to 50 years. 51 to 100 year old houses are represented in **Category D**. Finally, houses older than 100 years belong to **Category E**.
Category A provides with a total quantity of 44 the biggest amount of cases, barely followed by Category B, with a total of 31 records. While the data sets of Category C and D are settled in the mid-section (with a nominal value of 24 for category C and 14 for category D), houses of Category E with three occurrences are found very rarely (Figure 2.10).

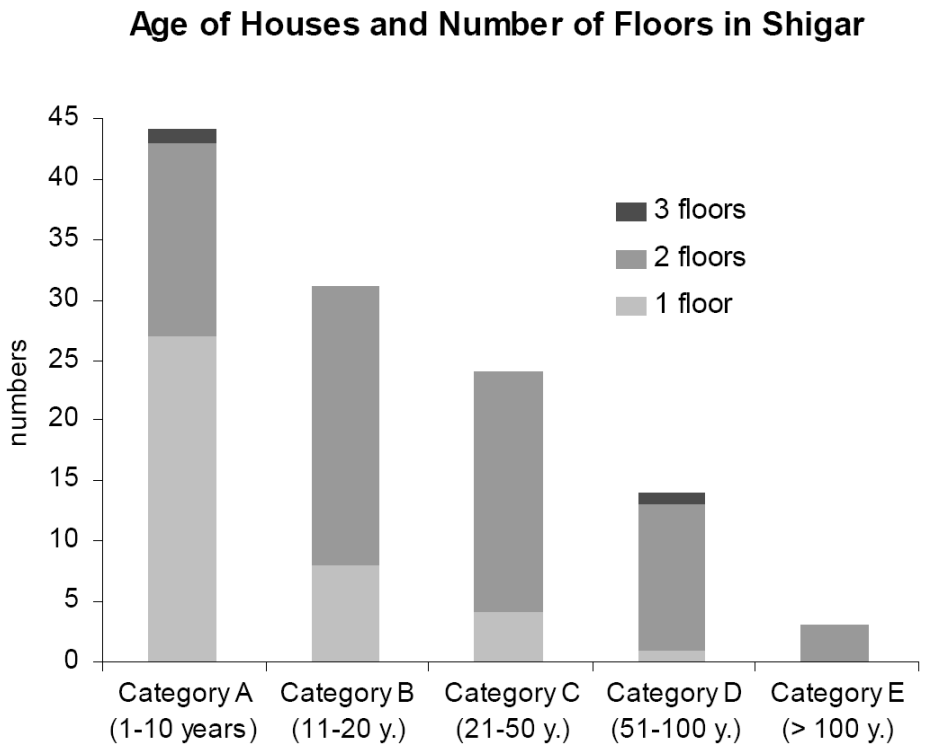


Figure 2.10 Frequent age of houses according to classified categories in the Shigar oasis
Data: Survey by Koss, Leimbach, Michel, Schoger 2008, n=116.

Concerning the quantity of rooms, the whole data set containing 124 samples was used. Accordingly, the average house in Shigar consists of approximately four living rooms, one kitchen and one bathroom as well as one storage room; this confirms the findings of IUCN (2007:30).
Besides the quantity of rooms, the number of floors was inquired, too. In the 116 sample data set, there are 40 single-storey houses and 74 two-storey houses; two houses even consist of three storeys. As assumed in the research hypothesis, the traditional two-storey house type is apparently replaced by new single-storey constructions. This is visualised in Figure 2.10 which indicates the correlation between the house's age and the number of floors. Even

though the two-storey house is still common among all categories, the vast majority of houses that have been built in the last ten years is single-floored. Nevertheless, houses with three floors remain exceptional.
The results of the qualitative research suggest that one-storey houses do not necessarily have to stay one-storey. Often this is only an interim phase due to lack of money preventing further constructions

2.4.1 Reasons for new constructions

During the field work, a total of 42 households were interviewed on facts referring to the general aspects of their house (e.g. age, building materials and dimensions). To obtain a representative cross-section through all types and ages of houses, people living in house-holds of both new and old houses were interviewed. Additionally, people living in new houses were asked about their motivation to build a new house and the selection criteria of their area of settlement.

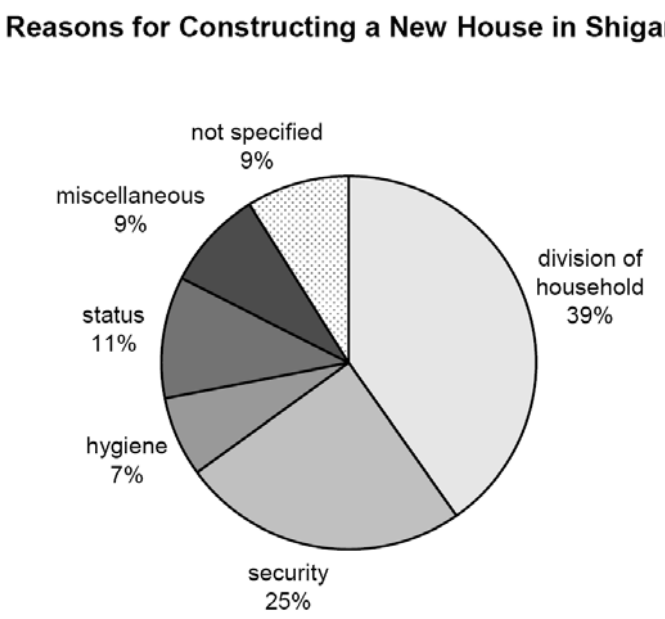


Figure 2.11 Reasons for constructing a new house in Shigar
Data: Survey by Koss, Leimbach, Michel, Schoger 2008.

Resembling Figure 2.11, the main reason for the construction of a new building is the additional living space for the residents. In Shigar, some houses are inhabited by more than 30 people, pushing the available space at its limits. However, at one point the household has to separate or some members of the household decide to settle in a new house. Furthermore, many old houses seemingly are close to collapse and for safety reasons relocation is required. Only a small share of new houses is built for hygienic and prestige reasons.

2.4.2 Choice of settlement area

Concerning the criteria of the settlement area for the construction of new houses, people obviously prefer their own estate or land, which is close to their property (Figure 2.12). Access to link roads seems to be increasingly important as a reason for a particular settlement, whereas safety reasons with regard to natural hazards are underrepresented.
Furthermore, one emphasis of the investigation was the evaluation of past and future reconstruction work in Shigar Proper. Even though the majority of interviewees (52.4%) stated that

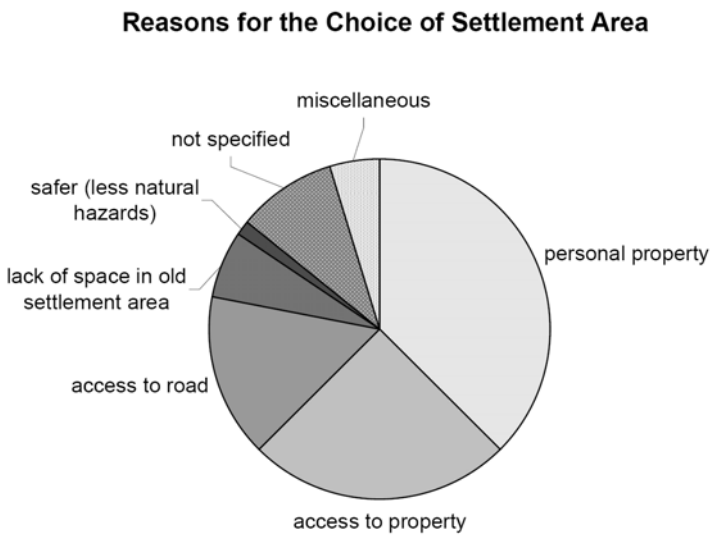


Figure 2.12 Reasons for the choice of settlement area
Data: Survey by Koss, Leimbach, Michel, Schoger 2008

the reconstruction of traditional houses is important, good or necessary (Table 2.1); only 33% can actually imagine inhabiting a traditional house themselves. Thus, two thirds of all residents do not prefer to live in a traditional house. This finding might have consequences and should be seriously considered for future approaches to preserve and change existing built environments.

Table 2.1 Interviewee's opinions about traditional housing and reconstructions

Opinions of traditional housing	Number	Percentage
I can imagine inhabiting a traditional house.	14	33%
I cannot imagine inhabiting a traditional house.	20	48%
Not specified	8	19%
Total	**42**	**100%**

Importance of reconstruction	Number	Percentage
I think, reconstructing traditional houses is important.	22	52%
I think, reconstructing traditional houses is unnecessary.	8	19%
Not specified	12	29%
Total	**42**	**100%**

Data: Survey by Koss, Leimbach, Michel, Schoger 2008

Although the energy efficiency is perceived worse in new buildings people still prefer living in new houses rather than in old ones. This can most likely be explained by the increase of living space dimensions in new houses. Hence, nearly 29% of the respondents prefer new constructions.

Concerning the upcoming reconstruction of traditional houses by IUCN, there is no widely scattered information disseminated among the population of Shigar. Only about 24% of the respondents ever heard about IUCN's plan to reconstruct traditional houses.

Table 2.2 Energy efficiency and dimensions of living space in newly constructed houses

Energy efficiency in new houses	Number	Percentage
Better	8	19%
Worse	12	29%
Equal	5	12%
Not specified	17	41%
Total	**42**	**100%**

Dimensions of living space in new houses	Number	Percentage
Bigger	25	60%
Smaller	3	7%
Equal	1	2%
Not specified	13	31%
Total	**42**	**100%**

Data: Survey by Koss, Leimbach, Michel, Schoger 2008

2.4.3 Reconstruction activities by IUCN

Based on the IUCN programme reports and the interview with Abbas Ali Shah, technical manager of AKCSP in Shigar, three main motives for the implementation of the reconstruction activities could be identified.

The first motive supporting the implementation of the programme is the cultural heritage aspect. In the course of time lifestyles are rapidly changing, so it is very important to keep old traditions and customs for multifarious reasons. Culture is a tool in the development process and buildings mirror the society (cf. interview with ABBAS ALI SHAH 2008). “In such a situation of transition and uncertainty, cultural heritage has a particular role to play, since it can inspire the self-confidence, social coherence and emotional stability needed to achieve cultural continuity” (AKTC 2005: 4).

The intention of AKCSP and IUCN to keep the cultural heritage is shared by the majority of the interviewees who stated that the programme is very important to preserve the knowledge of how to construct houses in a traditional manner. The built environment is one way to present their identity.

If people know how to use local materials in a traditional way, they are able to build up their own houses. They are more independent from foreign expertise and expensive imported products, which means lower costs in the process of construction (includes planning and constructing). The reconstruction of 12 traditional houses implemented by IUCN should be seen as an initial project which aims at the poorest of the poor. They are living in houses which are in danger to collapse and can neither afford reconstruction measures nor a new house on their own. These 12 houses are located in the hamlets around the Shigar Fort. The plan envisions creating a historical centre with the fort as a nucleus (cf. interview with ABBAS ALI SHAH 2008).

On the one hand the interviewees interpret the aid as sympathy for the poor. It would be highly appreciated if the essential monetary aid is provided to reconstruct their decrepit traditional house. On the other hand there are also statements indicating that people are not satisfied with the programme and its implementation. They complain that the reconstruction activities are restricted to the hamlets around the Shigar Fort and hence houses of people living in remote areas in the Shigar oasis will never be a potential reconstruction aim. Thus not the poor people and their living conditions are in the focus of the reconstruction activities but the creation of a historical centre e.g. as an attraction for foreign tourists. Another statement displays that there is also the fear of a potential expropriation by the donors once the house is completely reconstructed. Not only the fort was restored, but also "the new palace of the Mir of Shigar fully utilises the techniques for engineering and architectural purposes" (HUGHES & LEFORT 2006:300).
The approach of AKCSP and IUCN in Shigar is similar to the activities which took place in Hunza in the 1990's. In Karimabad "the planers of the Baltit fort restoration project (…) had realized fairly early that the restoration of the Baltit Fort will have a significant impact on the built environment of Baltit" (MASOOD KHAN 2006:308). There is not only an impact on the built environment assessable but also an improved situation in the tourism sector: "Since the official opening of Baltit Fort by His Highness the Aga Khan and the President of Pakistan in Sep-tember 1996, the conserved fort and a cluster of associated traditional houses has become a major tourist cultural attraction for the whole of the country" (HUGHES & LEFORT 2006:304).

The second motivation to implement the programme is to promote the process of participation. Besides the cultural aspect, participation is another important tool promoting sustainable development of the people's livelihood. In order to enhance this process the STMS was founded. This institution is also used by AKCSP for realising the reconstruction programme (cf. HUGHES 2005; MASOOD KHAN 2005). Together with the members of the STMS, who are the representatives of the different ham-lets' inhabitants of Shigar, the 12 houses for reconstructions measures were chosen. There are deliberations between AKCSP and the STMS, if the location of the 12 houses should be integrated in maps and if it is ingenious to set up sign-posts in the oasis, so that everyone is able to find the locations of the reconstructions.
The initiative of AKCSP is to implement a community based integrated programme. AKCSP is building up a fiscal frame and offers tools and workshops according to the reconstruction activities. The STMS is responsible for formulating the needs of the people, decision-making and leading the project (cf. interview with ABBAS ALI SHAH 2008).
The reconstruction of the Shigar Fort was a semi community based integrated project. At that point of time the people of Shigar were not able to decide about the necessity of the project but they were integrated in the physical process of reconstruction. Due to the reconstruction activities both the possibility of earning money and the chance of capacity building, i.e. learning the traditional way of rebuilding houses is revealed. This "practical workshop" was one part of the training process for local people in building houses in a traditional manner (cf. interview with ABBAS ALI SHAH 2008).

One interviewee mentioned the job-creation as a positive effect of the reconstruction activities and emphasised the importance of diverse possibilities for monetary income besides the trade of agricultural goods.
The participatory planning process and the evolving of town management societies (TMS) are visible in many valleys in the Northern Areas, e.g. in Karimabad (Hunza) where the TMS is dealing with the "participation of women and a fuller participation of the community in both physical and financial terms" (MASOOD KHAN 2006:318). The exchange of knowledge and experiences is very important and hence "visits have been arranged for members of the Shigar community to Karimabad, Ganesh and Altit in Hunza" (ibid.: 308).

Figure 2.13 A dismantled settlement core in the Shigar oasis.
Photo: Leimbach 2008

Beside the aspects of the cultural heritage and the participation of local people, the avoidance of pressure on agricultural land for settlement purposes is very important and the third reason for implementing the reconstruction programme. The expansion of settlements results in the loss of agricultural land. People are interested to improve their livelihoods and therefore leave the old traditional settlement cores to allow for building newer and bigger houses. This is possible because the existing legal framework is not observed by the people. In Shigar people follow their own indigenous legislation and property rights which are regulated individually and rooted in the traditional clan structure. Consequentially common management or planning are non-existing and hence will be a big challenge for the future. The programme of reconstructing old houses could be the chance of motivating people to stay or even to come back to the settlement cores and to rebuild the dismantled areas (cf. interview with ABBAS ALI SHAH 2008). Concerning these aspects, the reconstruction project of the Baltit

Fort and the bordering villages in Hunza was very successful. “The pressure on agricultural land for settlement purposes has now abated largely through the conservation of the historic villages below the Baltit Fort” (MASOOD KHAN 2006:317).
In chapter 2.4.2 the inhabitants’ reasons for migrating from the traditional settlement core with its cramped living conditions to the agricultural land are outlined. The dismantled areas (Figure 2.13) are the result of the deconstruction of the old houses in the hamlet. The old material is used for constructing both new houses and walls or canals.

2.5 Conclusion

The presented maps clearly reveal the extension of the built environment in the Shigar oasis during the last decade. The findings clearly indicate a shift from old to new buildings on former agricultural land since the last decade and hence, an expansion of the settled area is noticeable. The quantitative analysis of the questionnaires supports the conclusion based on the mapping and illustrates that there is the trend to settle on former cropland. The vicinity to roads and thus an improved infrastructural access seem to be a significant aspect for the house owners concerning their choice of settlement place. The fact that newly built residential houses are placed beside the habitat agglomerations instead of close to the settlement core, lead to the perception that there is a process of expansion in the habitats of Shigar Proper.
The interpretation of Abbas Ali Shah’s statements and the opinions of the interviewed inhabitants were in conformity with examples from project findings in other valleys, i.e. Hunza. They provided a deeper insight and comprehension of the situation in Shigar. It becomes clear that the topic of built environment has a greater meaning than the reference to the technical term alone. Therefore the evidence of different successful examples outside the Shigar microcosm does not necessarily imply that the guideline model is operational everywhere. Instead it requires that different aspects are considered attentively before implementation.
Development must not happen uncontrolled, it has to be managed. “The incidence of needless demolition of traditional houses is going on” (AKTC 2005:62). But what kind of management is needed here? Nowadays, people possess more money and as a result they try to improve their livelihoods by constructing new houses with better sanitation, tap water and so forth. Therefore it is necessary to install an alliance between the people’s image of improved livelihood and the work of AKCSP in Shigar. The benefit of AKCSP will not be visible in the short run and hence people have to be prepared and sensitive for long-term improvements and fell equitably represented by the STMS.
Furthermore it is recommended to develop a land use plan in order to govern the development and avoid land fragmentation. In addition an alternative programme clarifying how to involve the community in the decision making process seems to be necessary. In this way the decisions will be respected and can be implemented.

3. Infrastructure in Shigar

Rachid Altenkirch, Malte Wrede

3.1 Introduction and research concept

The infrastructural environment in many ways represents an important factor for the development of a village. Thus, a good infrastructural setting supports development efforts, whereas a lack of infrastructure hampers development.

This process affects particularly isolated mountain areas. These regions are often hard to develop and therefore the installation of infrastructural setting is connected with higher technical, financial expense and special challenges. About this, the poet William Blake said: "Great things are done when men and mountain meet" (quoted after ALLAN 1989:130). One of these infrastructural achievements in the Northern Areas of Pakistan is represented by the Karakorum Highway (KKH), completed in 1978 (cf. Kreutzmann 2000c, 2004). The KKH links up plenty of mountain villages, which are located in its catchment area. The results of such an important infrastructural development are changes of traditional life and economy in the mountain environment of northern Pakistan. As a result, an increased contact among the villages and people was enabled and, consequently, an exchange of products, workers and information.

A further effect of infrastructural improvement is an increased differentiated settlement development. According to DITTMANN & EHLERS (2004), a sevenfold differentiated settlement network has formed. Therefore, Gilgit, Chilas and Skardu are the only 1st rank central places of the northern areas with national/international traffic, market and administrative functions whereas Shigar is classified as a 3rd rank central place with local traffic, market and administrative functions (DITTMANN & EHLERS 2004:291). Due to the proximity to Skardu, the infrastructural setting of Shigar is nowadays strongly directed to Skardu and the traditional role of a valley as an isolated area is replaced by an increased exchange of people, goods and ideas.

Furthermore, the increased traffic and settlement development in the Northern Areas has effects on local farming. The partial transition from dominated subsistence agriculture to market economy represents one of these processes. This affects mainly marketing goods like apricots or potatoes, which can be increasingly transported and exported from these regions to down country Pakistan today. External influences like the introduction of innovative technical tools or efficient growing products become more important through an improved infrastructural development as well (DITTMANN & EHLERS 2004:293). Furthermore, a safer and easier traffic connection results in a better accessibility and supports the increasing importance of tourism to the Northern Areas (in Shigar: restoration of Shigar Fort; extension of mountain tourism, especially to K2). In contrast, inadequate communication and roads hamper the integration of markets in developing countries. "Transport infrastructure is essential, if farmers are to get their goods to markets in time. However, it does not only serve marketing purposes. Roads are also relevant in other respects. Inadequate transport infrastructure presents a serious health risk" (ASENSO-OKYERE 2008) because medical institutions could not be reached in time.

Beside the traffic development, electricity and telecommunication found their way into many valleys as well (cf. KREUTZMANN 2005d). A sufficient supply of energy is essential for generating additional income in off-farm activities and adding value to agricultural produce. Furthermore, the extension of telecommunication infrastructure and therewith a better supply with information is an important way of linking farmers to markets. Mobile phones facilitate networking and transferring knowledge about technology and farming practices (ASENSO-OKYERE 2008). The influence of state and foreign television, telephone and internet has risen as well as technical tools in the households.

The infrastructure in Shigar Proper, focused on roads, the public power grid and the telecommunication infrastructure, is the subject of this chapter. Changes during the last ten years and the present status of affairs are studied, as well as some recommendations for improvement of infrastructure are offered.

To present a reference tool, the asset of roads, further classified to width, surface and suitability, the public power grid and the telecommunication infrastructure were comprehensively mapped. However, the power and telephone grid could only be partially recorded and in some areas the estimated cable routing got documented.

To support our mapping exercise, several expert interviews with members of the Union Councils, Shigar Town Management Society (STMS), employees of the Aga Khan Cultural Service Pakistan (AKCSP) and employees of the power station and substation were executed. Furthermore, expert interviews with owners of the Public Call Offices (PCO) and share-taxi drivers enriched the information. To monitor the diurnal traffic volume, on two mornings a systematic traffic observation was held and some questions could be included in the general household questionnaire. Subsequent to our study the received data have been carefully analysed and evaluated, whereas the survey data was digitised in GIS.

The results of the evaluation and digitisation process are presented in the following chapters and thematic maps. For reasons of better clarity the results are divided into three parts, starting with roads, followed by the power grid and finished with the telecommunication infrastructure.

3.2 Traffic infrastructure

Broad fields of public and private life are largely depending on the existence of a sufficient and capable traffic infrastructure. This notably affects trade, commerce and supply, as well as, for instance, the labour market.

Due to the mapping, the overall length of the current road network in Shigar is about 40 km. With a share of about 78%, the major part of the road network is unmetalled. Only about 21% of the road network, namely the main road to Skardu and the road from the new *bazaar* to Shigar River, have a metalled surface. Roads paved by AKCSP only exist in the main *bazaar* area and in the old *bazaar* in Halpapa (Annex A, Map 3.1).

The traffic infrastructure in Shigar Proper significantly changed during the last ten years. The Government of Pakistan (GoP), as well as non-governmental organisations (NGOs) like the Aga Khan Rural Support Programme (AKRSP) or AKCSP have invested in several road building and upgrading projects.

For instance, in 2002 the Ghzoapa-Link-Road, leading from the petrol station to the westward fields, and in 2003 the Yulba-Shigar-Link-Road, leading to a viewpoint above Shigar-Fort, were built. Thereby, the latter was especially constructed to promote tourism. Finance and construction of both link roads were performed in cooperation of AKRSP and Pakistan Poverty Alleviation Fund (PPAF). PPAF was especially created for the support of rural areas, financed by the GoP and other international donors (Figure 3.1). To a minor degree funding and construction material were also provided by the local community.

Figure 3.1 Project signs of Yulba-Shigar and Ghzoapa-Link-Road
Photo: Altenkirch 2008

Paving of the main *bazaar* and the *bazaar* in Halpapa between 2001 and 2002 was initiated and co-financed by AKCSP. This project was performed basically in conjunction with the restoration of the Shigar Fort between 1999 and 2005 by Aga Khan Trust for Culture (AKTC). Repairs of the roads leading from the fort to the polo ground and to the northern *bazaar* in 2004 and 2006 also took place in cooperation with AKCSP (Annex A, Map 3.1). The actual construction work was performed by local people, to whom this work represented an acceptable and sometimes important additional income. Responsibility for further maintenance work after completion is assumed by the local community.

Overall, projects performed by AKCSP concentrate more on the conservation of cultural heritage. This becomes even clearer regarding actual and further planning. Thus, projects in which traditional houses are restored were started in Agepa, Chamaqpa, Ghzoapa and Gyanpa. In conjunction, an upgrade of the respective main roads in these villages is planned. For this reason, AKCSP employees started developing detailed, large scale mapping bases at the time of our field work. Decision making about appropriate villages for future projects includes local STMS. Founded in the year 2000, STMS sends proposals to AKCSP which is taking the final decision.

According to information from an AKCSP employee, similar planning for different villages is done at the same time, while project budgets are only determined once in a year, which is leading to major uncertainty. In general, long-term planning with this form of budgeting strategy is difficult.

However, a high level of contentment with the cooperation between STMS and AKCSP can be observed on both sides. In contrast to this mutually beneficial relationship, the cooperation with the local administration seems problematic. For instance, complaints about not including suggestions in actual planning as a policy of the STMS could be heard. Overall, a lack of competence, regarding appropriate investment of funds, especially in lower levels of administration, must be stated.

Another important change regarding traffic infrastructure was the upgrade of the main road by the GoP, which was finished in 2003. In this context, the road leading from Skardu to Shigar was completely metalled up to the village of Xserdrong (Annex A, Map 3.1). This upgrade had correspondingly effects on the traffic in Shigar and especially between Skardu and Shigar. Thus, interviews with share-taxi drivers have revealed that traffic volume has approximately quadrupled since 2003. Furthermore, travel time from Shigar to Skardu has decreased from up to two hours before 2003 to approximately 40 minutes today. Additionally, it is now possible to use cars and vans instead of four-wheel drives. Already more than 50% of the current road network can be used by these on-road vehicles (Annex A, Map 3.1). The traffic observation showed that after only five years, on-road vehicles reached a share of 50% of traffic nowadays (Figure 3.2). In addition, reduced travel time and increased reliability of the connection offer new possibilities of mobility. Since then, residents of Shigar Proper can commute daily to work in Skardu. Referring to information gained from share-taxi drivers, commuters have a share of more than 50% of the passengers by now. Based on the traffic observation, this would be more than 150 persons per day. Furthermore, there is now the possibility to offer day trips for tourists from Skardu to Shigar, especially to Shigar Fort. Also a faster and more reliable supply, especially in the field of medical care, can be stated.

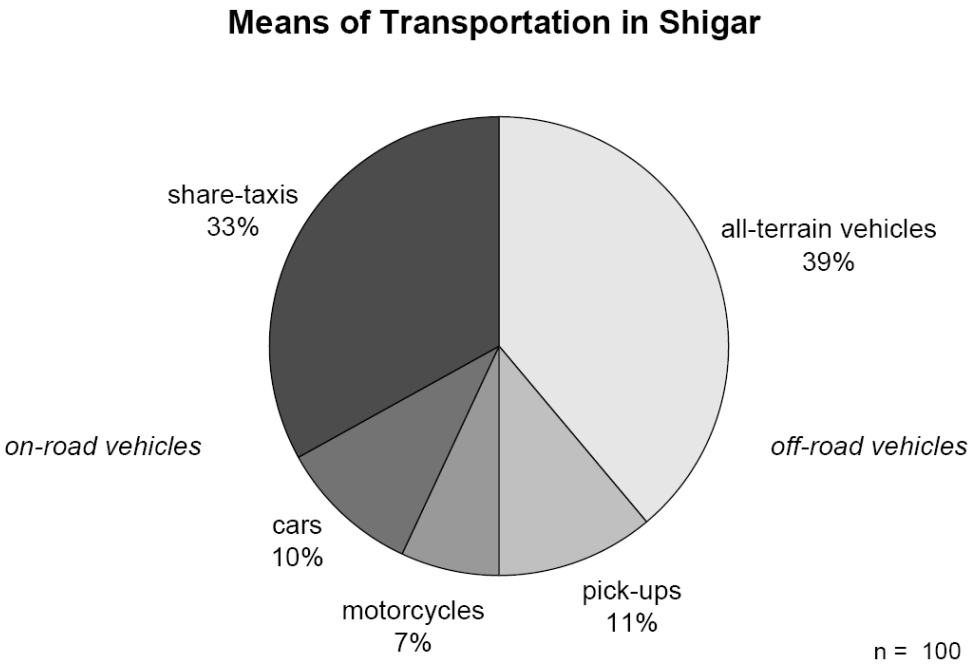


Figure 3.2 Means of transportation used in Shigar
Source: Survey by Altenkirch & Wrede 2008

However, the upgrade of the main road is connected also with some negative consequences: Higher travel speed and increased traffic volume result in a higher accident risk. Additionally, the metalled surface blocks the seepage of water, which comprises a higher risk of icing in winter. A technically simple drainage system could contribute to an increased safety in traffic, but there is no actual planning regarding this problem and probably a lack of allocated funds. In general, information about future investments by GoP is quite vague. Further roads shall be upgraded every year, though place and extent remain unclear. In principle high contentment with the actual status of traffic infrastructure by the local administration can be stated. Hence, there are barely any suggestions for improvement. Merely the upgrade of the main road further north, up the Shigar valley is named as a possible future investment with the aim to improve the supply of northward villages, but mainly to extend mountain tourism, especially to K2.

In conclusion, the upgrade of the main road between 2001 and 2003 has triggered-off an important impulse for development in Shigar. Especially in connection with the projects performed by AKCSP and AKTC the tourist attractiveness has clearly increased and in addition, provides potential for further development. The projects by AKRSP made sure that beside the improved connection to Skardu, the road development in Shigar itself has been improved.

3.3 Public power grid

The installation of the public power grid started in connection with the construction of the first power plant in 1977 by GoP. Subsequently, the grid was extended stepwise to the Union Councils of Marapi and Markunja, organised by Water and Power Department (WPD). In 2004 the power grid was expanded to the third Union Council of Chhurka. Based on our study and information gained through some expert interviews, 95% of households in Shigar Proper are connected to the public power grid nowadays. Thereby, cable routing of major parts of the power grid can be extracted from the Infrastructure Overview Map (Annex A, Map 3.2).

Figure 3.3 Provisional connected power cables
Photo: Altenkirch 2008

Maintenance work is done by local technicians. They are responsible for checking cables and poles and repairing minor damages like broken cables in consequence of overturned trees. According to interviews held with these technicians, overturning trees are furthermore the only natural hazard endangering the power grid. For major problems experts from the main department in Skardu are requested. This institution is in charge of the whole region of Skardu and responsible for the

distribution of materials and spare parts, which are mainly received from Lahore.
Actually the main problem is that since the expansion of the power grid to Chhurka in 2004, the available capacity of the power plant is not sufficient to provide continuous energy to the households of all three union councils. In consequence the well-known problem of load-shedding exists. The evaluation of our data revealed that this problem represents the main source of discontentment with the public power supply for half of the people. According to employees of the substation, there are plans for a new power plant above the existing one to extend the capacity from actual 450 – 500 kW up to 1,500 kW. However, this strategy to solve the problem of load-shedding has little prospect of success, due to the accident-sensitive public power grid and outdated technical infrastructure. Many of the used devices were installed in the 1970s and the grid is not capable of transferring higher capacities than 500 kW. The bad condition of the power grid was confirmed by provisional connected cables, noticed during our study (Figure 3.3). Regarding these problems it may be more promising to invest in an upgrade of the power grid before investing in a new power plant.

3.4 Telecommunication infrastructure

Development of telecommunication infrastructure in Shigar began about 15 years ago with the installation of a conventional telephone network. Today, about 20% of the households in Shigar are provided with landline telephone access. A major change in the field of telecommunication took place in March 2007 with the start of a mobile phone network. Since then, popularity of mobile phone use has soared and today about 58% of Shigar households are using cell phones (Figure 3.4).

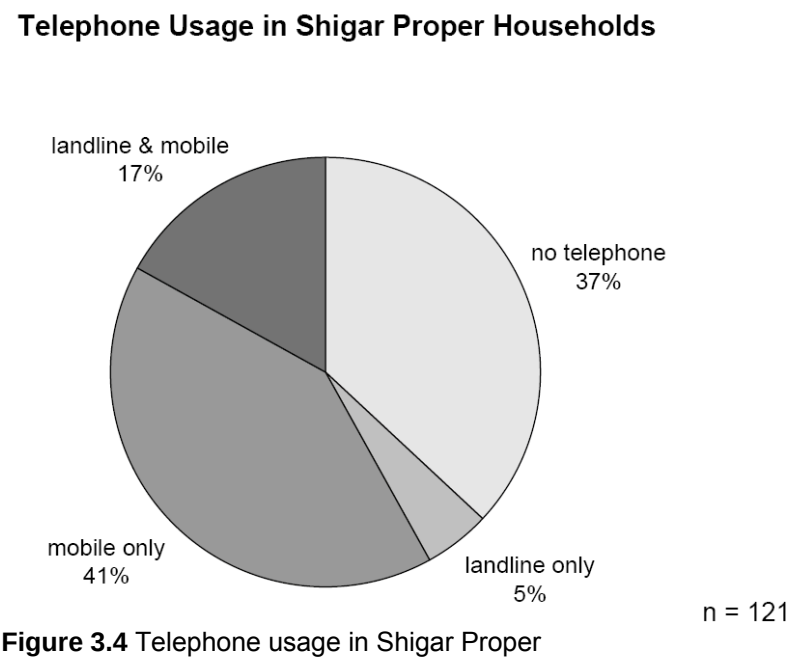


Figure 3.4 Telephone usage in Shigar Proper
Data: Survey by FU Berlin Team 2008

With the construction of additional mobile phone poles (Figure 3.5) the number of mobile phone providers has increased to currently four (Warid, Telenor, Ufone, SCOM).
Therefore, the huge success of mobile phone connections has led to an almost complete displacement of the conventional telephone network. Especially Public Call Offices (PCOs), as providers of classical telecommunication services, are facing major problems. According to PCO owners seven PCOs had to close their business due to a decrease of customers of up to 90% since 2007. The remaining four PCOs (Figure 3.5) had to change their business to avoid being forced out of the market. They are now offering mobile phone services, too. However, competition is high since SIM and value cards are also being sold in general stores.

At least, the resulting decrease of income is partly absorbed by a mixed business practice; all remaining PCOs are selling medical products as well.
One possibility to conserve the business model of PCO could be a more commercial use of the internet. However, internet connections in Shigar exist only since the beginning of 2008. Because of this early stage of development there are still problems concerning the transmission quality and capacity. Currently there are two internet providers in Shigar, SNET and ComSat, which are offering similar services but highly differ in fees.

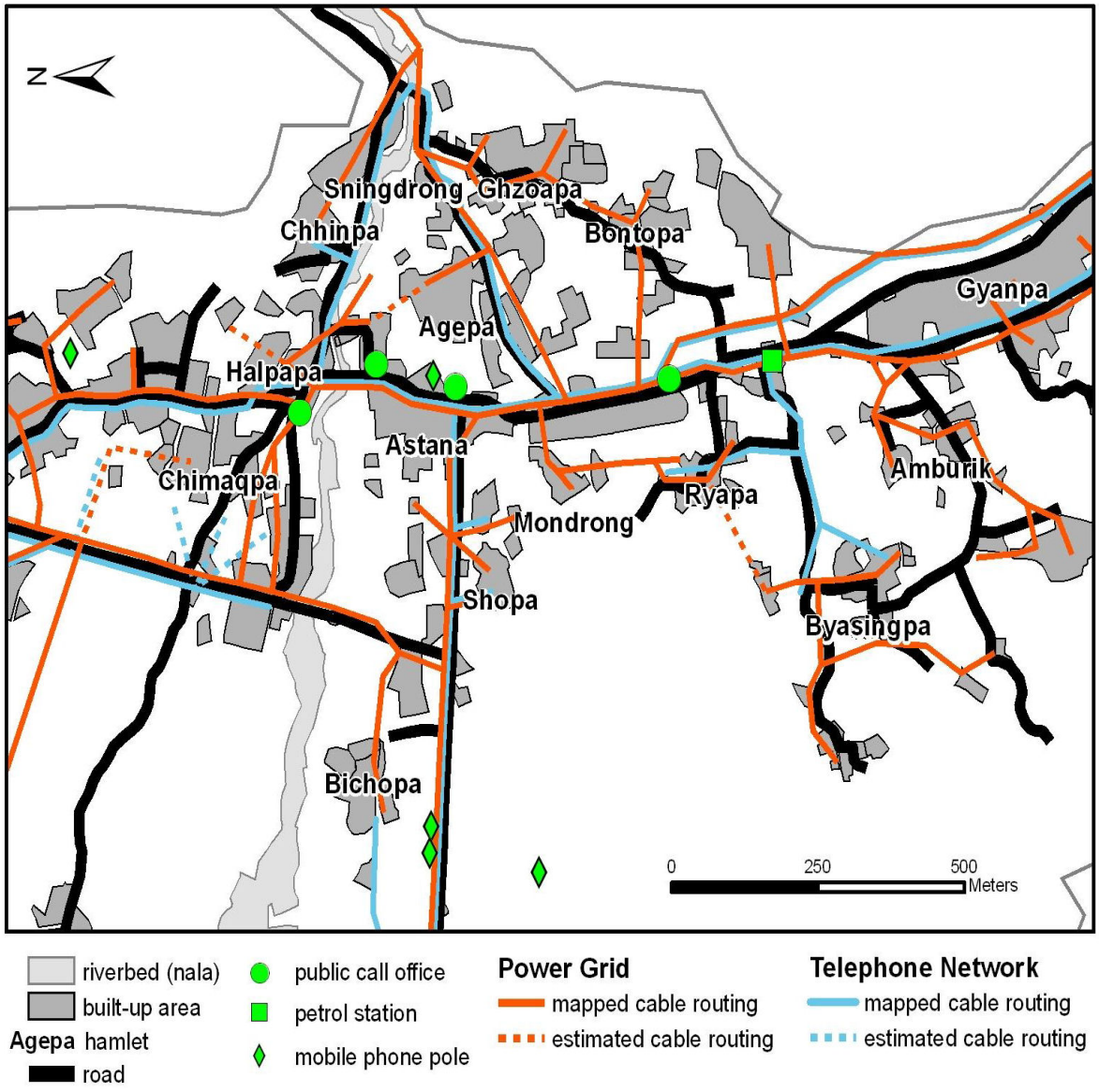


Figure 3.5 Detail of infrastructure overview map of Shigar
Data: Survey by Altenkirch & Wrede 2008

As expected, the majority (78%) of the people in Shigar neither owns a personnel computer nor have internet access (Survey by FU Berlin Team 2008). Yet the development of the mobile phone sector has shown that people in Shigar are interested in using innovative communication technology. However, in contrast to the lower acquisition costs of a cell phone, a computer and an internet access are mostly unaffordable. The PCOs could bridge this gap in the market and provide the service of an “internet café”. One of the questioned PCO owners

already has internet access in his personal office but does not offer it to his customers yet. Nevertheless, there is potential for the future.
Furthermore, it is possible to use the mobile phone network to gain access to some online services. The question remains to what extent this competing form of internet access will be established in the future.

3.5 Conclusions and recommendations

The infrastructure in Shigar has changed to a major degree during the last years. As shown in this chapter, the Government of Pakistan as well as non-governmental organisations have invested in several road building and upgrading projects. The improvement of infrastructural setting, especially the upgrade of the main road strengthened the link to Skardu (1st rank central place with national/international traffic, market and administrative functions) and resulted in an increased exchange of people, goods and information, and created new possibilities for mobility and supply. This also had an impact on other fields of social, economic and cultural life, like labour market and tourism. This process is supported by positive development of the telecommunication infrastructure, especially in the mobile phone sector. On the other hand the public power grid does not keep up with this positive progress and, in the current condition, represses further development.
With regard to the future, the elaboration of a detailed infrastructure development plan by the government would be beneficial for ongoing positive progress. “As infrastructure investments are expensive, decisions must be well considered and suit the communities they are meant to serve. To reduce the cost of infrastructure, interventions should be planned, financed and executed by regional partners with a sense of purpose. Moreover, it will often make more sense to opt for appropriate technology than to try to install the most advanced technologies” (ASENSO-OKYERE 2008).
Therefore it is recommended for Shigar to continue the implementation process of locally adapted infrastructural solutions under consideration of local needs and with adequate community participation at all stages of the project planning and execution.

4. Energy supply in Shigar: organisation and challenges

Lars Bräunig, Stefanie Wiemer

4.1 Introduction and methods applied

Regarding the issue of energy supply in Shigar, the main focus of research is on the analysis of energy sources used and the purpose of its use in general. Moreover, it is of high interest to understand how a growing population is able to satisfy its increasing need for energy.

The main methods for gathering data have been two types of interviews: First, standardised interviews were conducted in 80 households. These have delivered a nearly representative amount of quantitative data. According to the survey made by IUCN in November 2007 (IUCN 2007:11), 1242 households with 10,090 individuals were counted in the Union Councils (UC) Marapi and Markunja. Therefore, the sample of interviewed households is equal to approximately 6.5% of the population. Supplementary, 124 households have been interviewed within the scope of a large-scale, general household survey from which additional samples were used for this analysis. In doing so, one member per household has been asked ten questions regarding sources of energy used, its purpose of use, corresponding expenses, number and type of electrical appliances used, number of household members, number of rooms, etc.

Second, in order to gather qualitative information, semi-structured and non-standardised interviews were conducted with several experts by using a guideline. These open interviews were always carried out as face-to-face discussions. In general, one person held the interview, while the co-researcher took notes.

Experts were among others the chairman of UC Markunja, some small-scale businessmen, officers of the hydroelectric power plant (HPP) of Shigar Proper and its substation, the president of the STMS, as well as persons in charge in the billing office and at the water reservoir tanks.

4.2 Utilisation of energy resources

According to IUCN, the per capita rate of energy consumption in the Northern Areas is the lowest in Pakistan. Firewood, kerosene oil, electricity, liquefied petroleum gas (LPG), diesel oil and batteries are the energy sources most frequently used in this region. The main source is firewood, which is used by almost 100% of the inhabitants. It is principally used for cooking and heating, and mainly collected in the forests. Kerosene is the second most commonly used energy source. It is mainly used for lighting, particularly when electricity supply is disrupted, and also for cooking.

The power system in the Northern Areas is independent of the national grid. Electricity is primarily generated by hydropower stations and some thermal stations, but still demand exceeds supply (IUCN 2003). According to estimations from 2001 about 42% of the households in the Northern Areas have access to electricity (IUCN 2003:15).[3]

[3] According to ESMAP (2006:167) about 69% of the households in the Northern Areas were using electricity in 2001.

4.2.1 Sources of energy

In Shigar, the main sources of energy are wood, animal dung, LPG, kerosene and hydropower. Firewood is still the most important energy source for cooking and heating, and is used by 99% of the respondents (see Figure 4.1).

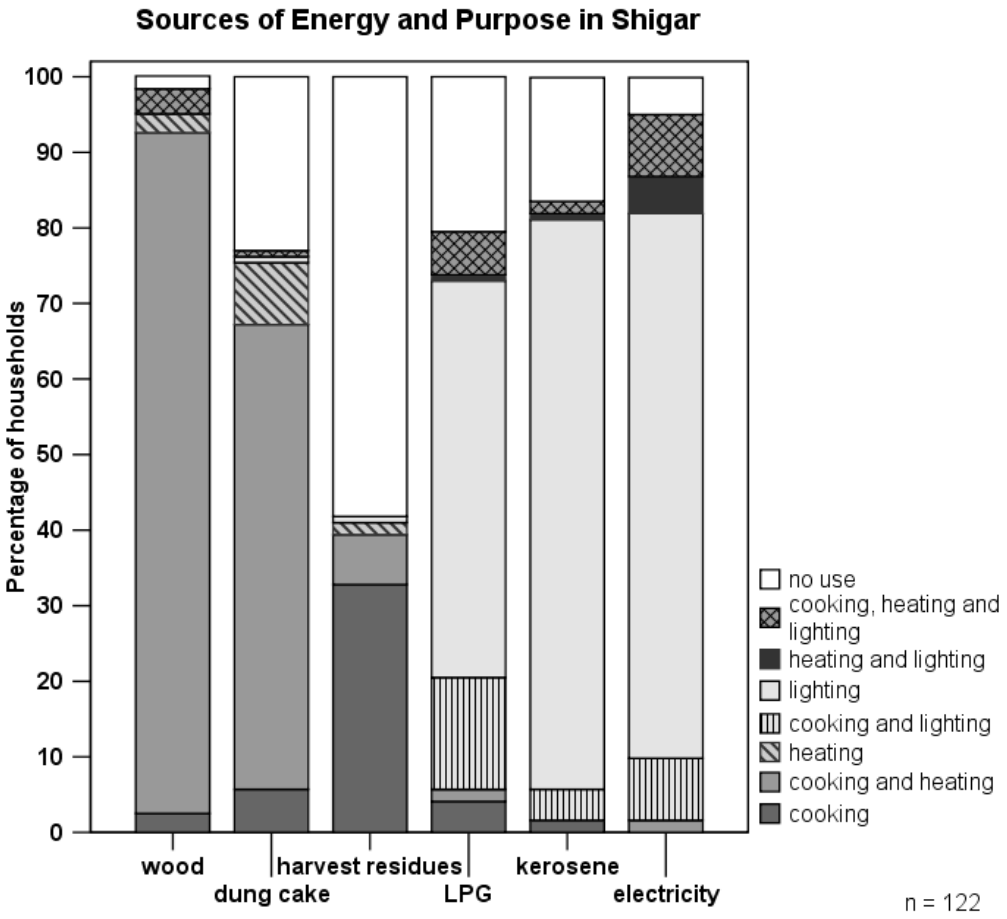


Figure 4.1 Sources of energy and purpose.
Data: Survey by FU Berlin Team 2008.

Dung cakes are additionally used for the same purpose by 77%. Although of less importance than wood and dung, 42% of the respondents use harvest residues as a source of energy mainly for cooking. LPG is used by 80% and kerosene by 84% of the interviewed persons, primarily for lighting when electricity supply is disrupted. By contrast, 22% of the respondents use LPG and 8% kerosene for cooking. The high rate of LPG consumption contrasts to earlier surveys carried out in the Northern Areas, which figured out that LPG is only used by a small number of domestic households (IUCN 2003; ESMAP 2006). This indicates that the usage of LPG is rising.

Electricity is consumed by 95% of the households mainly for lighting and electrical appliances mostly irons and radios. In many cases radios are battery-operated, and thus barely any electricity from the HPP is used for this purpose. Moreover, batteries are used by half of the respondents for torches in case of a power cut. Candles are also used for the purpose of lighting by 82% of the households.

4.2.2 Expenses on energy

The average expenses on energy amount to 19,000 Rs per year (Figure 4.2) which equates to 16% of the annual income of the respondents (Figure 4.3). Almost 60% of that amount is spent on firewood, 30% on LPG and 10% on electricity.
Kerosene is not included in these charts because most of the interviewees were uncertain about their expenses for kerosene. It is not as efficient as LPG and mainly used for lighting beside LPG, batteries and candles if electricity is not available. The expenses of the respondents vary between 100 and 300 Rs per month.

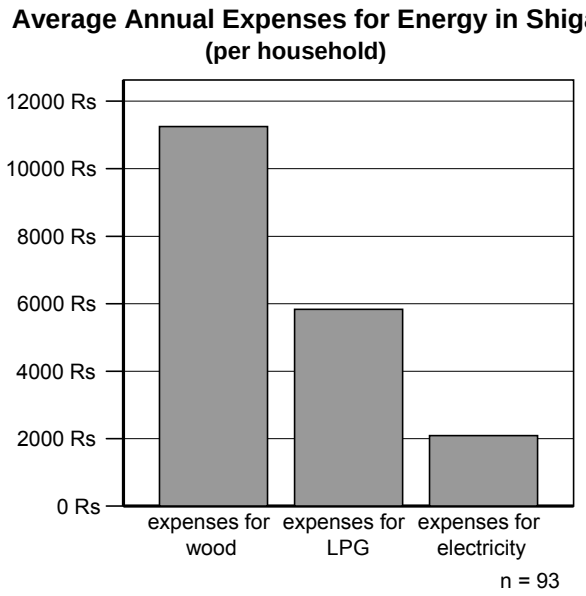


Figure 4.2 Average annual expenses for energy. Data: Survey by Bräunig & Wiemer 2008

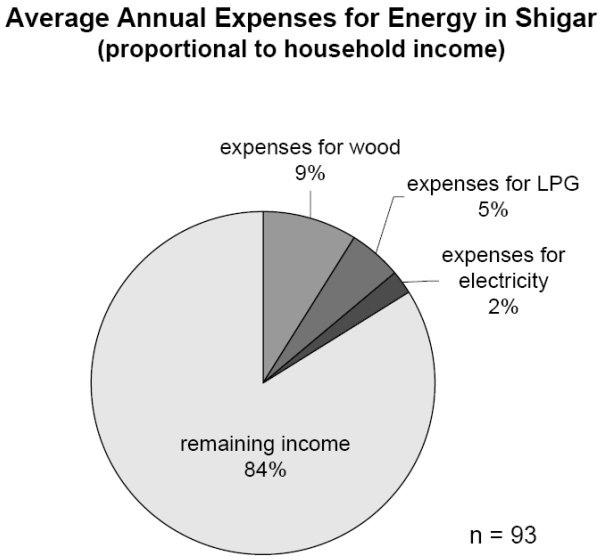


Figure 4.3 Average annual expenses for energy proportional to income (118,000 Rs per year). Data: Survey by Bräunig & Wiemer 2008.

As the figures illustrate, expenses for wood constitute the biggest share of energy costs. The prices for firewood range from 230 to 500 Rs per *maund* (= 37.32 kg) depending on quality (Table 4.1). Aside from buying firewood, collecting wood in the forest and growing trees is a further option for individuals to procure this natural source of energy. Birch trees, junipers, willows and artemisia are mostly cut down as firewood. In fact 62% of the respondents collect and grow wood themselves, while 22% of the respondents buy their wood at the bazaar, and 16% do both, buy and collect fuel. The wood being sold on the bazaar is mainly brought from Shigar and the surrounding area. It is either collected from the forests or brought by people who cut down their own trees and sell them. The proportion of firewood that is collected and purchased respectively depends on income. 76% of the households with a monthly income not exceeding 5,000 Rs collect or grow their own wood and only 13% of these households buy their wood at the bazaar. In comparison, 51% of the households with an income above 10,000 Rs per month collect or grow their wood themselves and 32% buy their firewood.

Table 4.1 Prices for energy sources in Shigar

Firewood (per *maund* = 37.32kg)	
Willow:	230 Rs
Mulberry:	260 Rs
Apricot:	350 Rs
Juniper:	500 Rs
Electricity (per kWh)	
Domestic:	1.82 – 4.52 Rs
Commercial:	4.86 – 6.81 Rs
Industrial:	3.04 Rs
LPG (11kg cylinder)	850 Rs (without deposit)
Kerosene (per gallon = 4.54 l)	190 Rs

Data: Survey by Bräunig & Wiemer 2008.

The expense for LPG constitutes the second biggest share of energy costs. If people can afford they use LPG not only for lighting but also for cooking and heating. LPG is more convenient to use than wood and also more efficient (Box 4.1).

For electricity households pay on average 174 Rs per month. The average consumption in domestic households is 64 kWh, although 62.3% of the respondents use less than 50 kWh per month (these data have been calculated on the basis of expenses for electricity and the kWh prices). The electricity consumption is measured by electric metres.

Box 4.1 Energy efficiency

As Figure 4.4 indicates, biofuels such as wood are much less efficient than LPG and kerosene. Although available for free, crop residues are the least efficient fuels. In addition, biofuels can have a negative impact on health by creating indoor air pollution due to the traditional cooking facilities. This affects mainly women and children. Using improved stoves might help to reduce pollution and raise the efficiency of biofuels. Nevertheless, kerosene and especially LPG are more convenient in use and more efficient. The latter burns cleanly and heat is easier to adjust. Therefore, the usage of LPG is rising in according with the income of households (World Bank 1996).

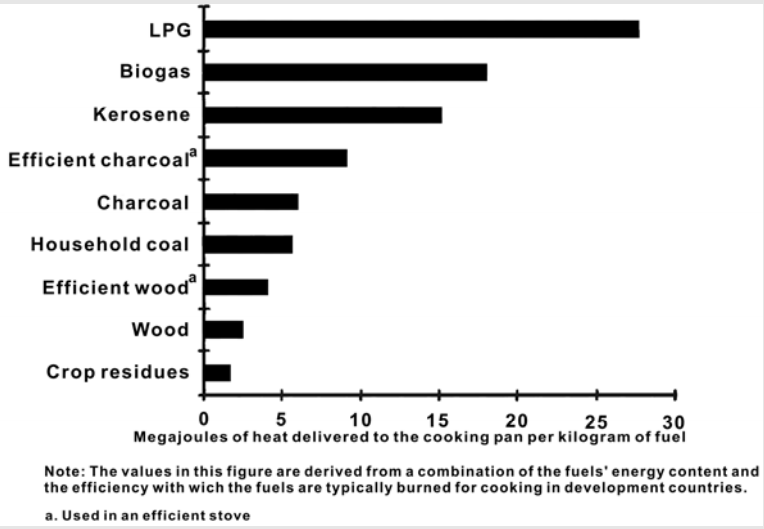


Figure 4.4 Energy efficiency of selected cooking fuels.
Source: World Bank (1996:27)

4.2.3 Energy expenses and consumption related to income

The expenses for energy differ according to monthly income. Households with a monthly income up to 5,000 Rs spend 13,700 Rs per year on energy. This equates to 31% of their annual income. In comparison, households with a monthly income above 10,000 Rs spend more than 25,000 Rs per year on energy, which equates to only 12% of their income (Figure 4.5).

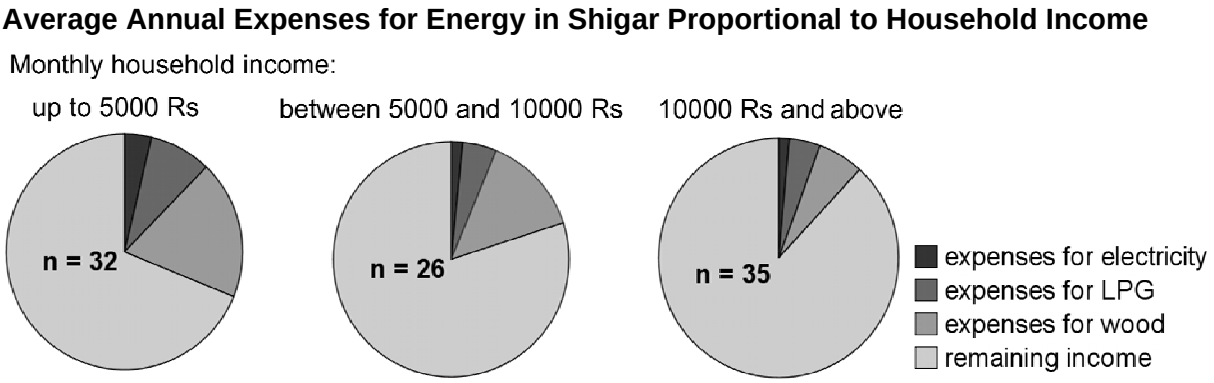


Figure 4.5 Average annual expenses for energy proportional to different household incomes
Data: Survey by Bräunig & Wiemer 2008.

As the figures indicate, expenses on wood constitute a much bigger share of energy expenses for low-income households. Even though those households collect their wood more frequently than households with higher income, 19% (8,300 Rs) of their annual income is spent on wood. Their expenses on LPG amount to 3,700 Rs and on electricity to 1,600 Rs. Households with an income above 10,000 Rs buy their wood more often and have a higher LPG consumption, in the majority of cases. On average, they annually pay 13,300 Rs for wood, 9,000 Rs for LPG, and 3,000 Rs for electricity. Aside from consumption of LPG rising in accordance with the income, the type of use is changing as well. The higher the income, the higher the proportion of households which are using LPG not solely for lighting, but also for cooking and heating (Figure 4.6).

On average, low-income households pay 135 Rs for electricity, while households with an income above 10,000 Rs pay 254 Rs per month. This equates to an average consumption of 64 kWh per month for low-income and 87 kWh per month for high-income households. As mentioned earlier, most households (95%) are using electricity at least for lighting. To gather more information about the required amount of electricity, people were asked about the electrical appliances they own (Figure 4.7).

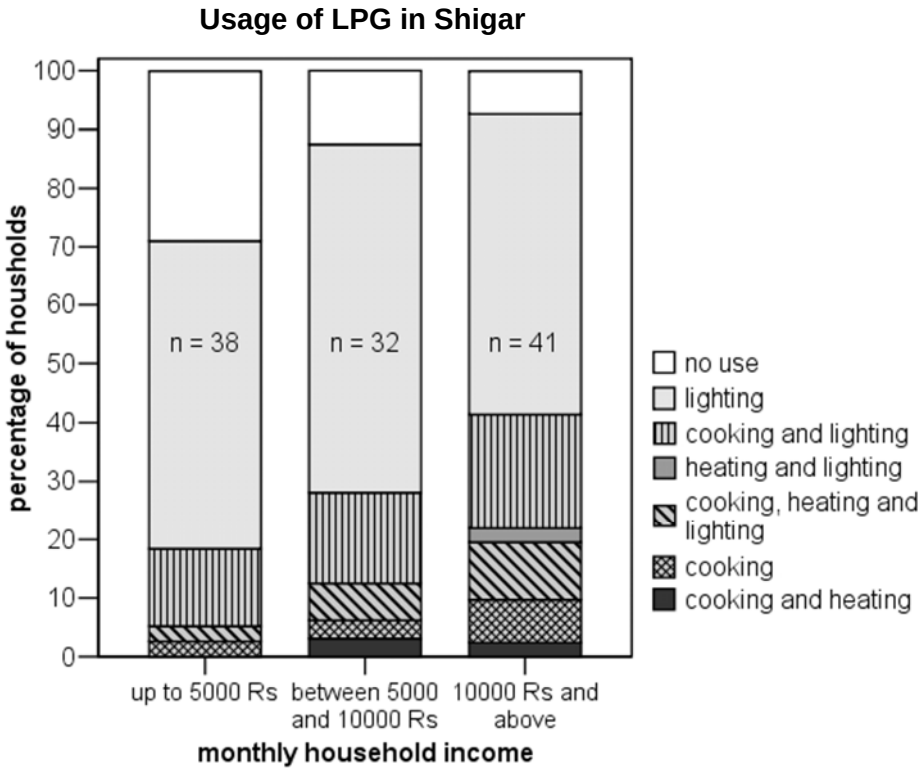


Figure 4.6 Type of LPG use in households with different income.
Data: Survey by FU Berlin Team 2008

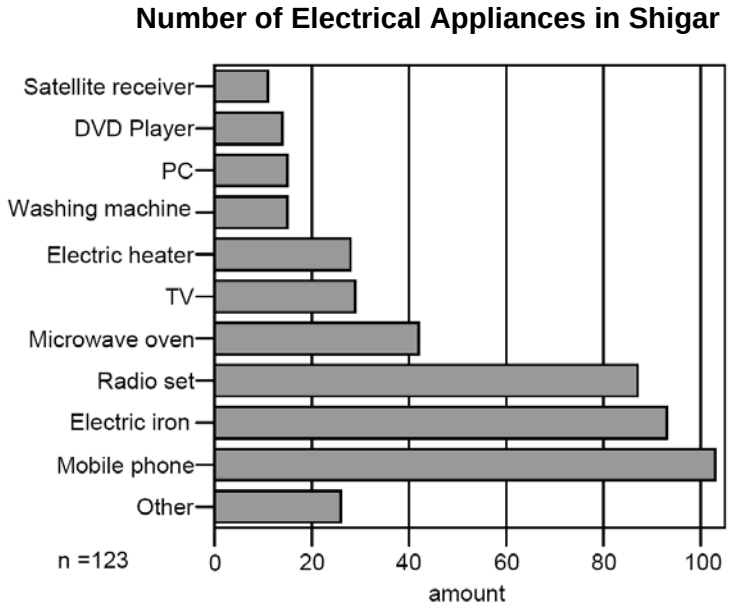


Figure 4.7 Number of electrical appliances in 123 households in Shigar.
Data: Survey by FU Berlin Team 2008

Altogether, 463 electrical appliances are being used in 123 households, which have been interviewed. Most common are mobile phones, electric irons and radio receivers. Though, not as many microwave ovens, TV sets and personal computers are owned by some households. Nevertheless, it is to assume that the number of electrical appliances and with that the demand for electricity will be rising. Electric irons and radio receivers are most prevalent also

in low-income households. More than half of the appliances recorded, especially those which consume a lot of electricity, are located in households with a monthly income above 10,000 Rs. In fact there are 258 electrical appliances in 41 of those households. But the consumption of electricity is not only limited by income, but also by availability. This is a problem particularly in winter when less electricity can be produced. As a result, the usage of electrical appliances with high power consumption, such as electric heaters is prohibited during winter season.

4.2.4 Challenges of energy supply

The main problems mentioned by the respondents are the increasing prices especially for wood and LPG, the insufficient supply with electricity and the decrease in forest cover (Figure 4.8).

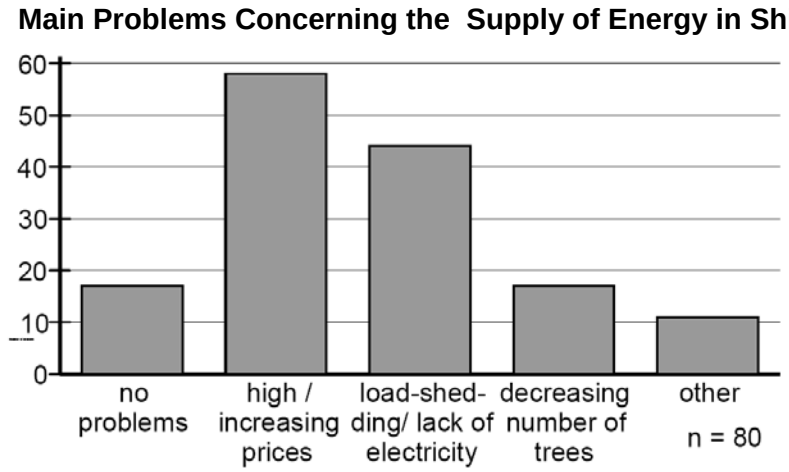


Figure 4.8 Problems concerning energy supply mentioned by interviewees
Data: Survey by Bräunig & Wiemer 2008

Collecting wood from the forest is a time consuming and exhausting work. And as to the interviewees the amount of wood in the forests is decreasing. Out of 31 persons who are collecting their wood themselves, 25 said that distances became longer. Many people stated that they would like to use more LPG instead of wood but are not able to afford it. A further shortcoming is the insufficient supply with electricity, which cannot comply with the demand. Particularly craftsmen are affected, as they need more electricity for their work. In general, the respondents complained about load shedding and a lack of electricity. Furthermore, it has been mentioned that sometimes not enough wood is available on the bazaar and also a shortage of energy sources like LPG and kerosene is perceivable, e.g. when the Karakoram Highway is blocked.

4.3 Hydroelectric power plant

Information on the present operating efficiency of the HPP was gathered by interviews with the supervisor of the HPP (Muhammad Iqbal) and his colleagues, with the persons in charge of the sub-station of the HPP (Amir Ali, Askari) and with the president of the STMS and member of the District Council of Skardu (Wazir Fida Ali).

Although, on record the hydro plant is designated to produce 1,000 kW, de facto its maximum capacity is 800 kW. In doing so, two turbines connected in parallel generate a maxi-

mum current of 400 kW each. Since most of the water derives as melt water from snowfields and glaciers, sufficient water is available during summer only. Accordingly, in the period between May and September/October, the plant operates on maximum efficiency. During winter, i.e. between October and April, temperatures in the mountains drop below freezing point, whereby nearly all precipitation is detained in form of snow. During winter period the HPP runs on reduced output. At the time of research for instance, efficiency has averaged between 350 and 400 kW. For this reason, only one turbine can produce energy in winter, while the other turbine is shut down. This is done also for the purpose of overhauling, since the sediment load carried by the water in summer causes damages to the turbines.

In winter the demand for electricity is higher, due to necessity for lighting and electrical heating. Correspondingly, the peak of demand is not concordant with the maximum output of the power station, which is reached in summertime. Vice versa, the demand for electricity in summer is below capacity.

Beside the possibility to operate two turbines during summer because of sufficient water availability, the electrical infrastructure is not capable of transporting the generated energy. The high-tension electric cables leading from the HPP are designed only to transport max. 500 kW. This circumstance entails that high consuming appliance needed, e.g. in sawmills and marble factories, could indeed be provided with enough amperage of max. 45.5 Amperes but with barely enough electric power, without shutting off energy supply for most of the other consumers. This again leads to the restriction that, according to Muhammad Saleem Rathor, those high consumers are only allowed to use their machines for maximal four hours per day, which furthermore, brings about a decrease in their productivity.

The unbalanced situation between demand of electricity, shortage of water and low capacity of the installed high-tension electric cables has necessitated alternatives to the existing HPP. The Water and Power Development Authority (WAPDA) completed its government-financed case study to install two new 500 kW turbines with serial connection. These shall be set up further upstream of the existing HPP. In combination with a replacement of the high-tension electric cables, a more efficient utilisation of water shall be achieved, especially during winter. Yet, a specific date for the implementation of construction work has not been determined.

While the existing HPP provides some electricity to Shigar oasis since its construction in 1999, the people in UC Chhurka were not supplied with electricity at all. In 2004 the situation has changed. Since that time, 10,090 citizens living in Shigar Proper and approx. 6,405 people from UC Chhurka have to share 400 kW.[4] That means that approx. 25 Watt provided from the installed HPP is available for each person. To grant at least enough power for the three UCs during the daily peak hours between 6 p.m. and 10 p.m., three water tanks have been installed upstream of the existing HPP. Aside from these four hours per day the following formula (Table 4.2) has been developed to guarantee a fair allocation of available electricity during winter (October – April):

[4] According to IUCN (2007) approx. 8.1 members live in each household in Shigar Proper. From the chairman of the UC Markunja it is known that there are about 700 households in Chhurka, i.e. about 5,670 people.

Table 4.2 Allocation formula of electricity during winter time

Time of Day	Procedure
07:00 a.m. – 08:00 a.m.	The water tanks upstream the HPP are filled partly; during that time none of the three UCs will be provided with power.
08:00 a.m. – 12:00 a.m.	The UC Marapi and Markunja are provided with power, Chhurka is not.
12:00 a.m. – 04:00 p.m.	The UC Chhurka is provided with power, Marapi and Markunja are not.
04:00 p.m. – 06:00 p.m.	The water tanks upstream the HPP are filled completely; during that time none of the three UCs will be provided with power.
06:00 p.m. – 10:00p.m.	At peak time of energy use all three UCs are provided with power.
10:00 p.m. – 07:00 a.m.	All three UCs are provided with power, but it is only allowed to use it for lighting; the use of heavy appliances is prohibited.

4.4 Discussion and conclusion

Recent research has shown significant changes in usage of energy sources in rural areas in the Northern Areas compared with data from the 1980s (cf. CLEMENS 2001:41). While wood is still the most important energy source for heating and cooking the usage of electricity for lighting has increased dramatically. In 1981 32,263 households were settling in Baltistan, from which 30,405 households were living in rural areas, like Shigar (CLEMENS 2001). According to number by the Government of Pakistan (1981) only 8.1% of households in Northern Areas were using electricity and 84.9% kerosene oil for lighting in 1981, while estimations from 2001 show that about 42% of the households in the Northern Areas have access to electricity (IUCN 2003:15). Recent results from spring 2008 disclose that almost all of the 1242 households in Shigar Proper are using electricity not only for lighting but also for an increasing number of electrical appliances. The mean specific capacities of all HPPs, which have been finalised between July 1994 and September 1999 in the Northern Areas, have been able to provide about 43 Watt per citizen (CLEMENS 2001:46). According to the figures shown above (25 Watt per person), even 10 years later Shigar is far below that standard. As a consequence, the current demands cannot be met at all and an increasing deficiency is to be expected. A prompt installation of the two new 500 kW turbines with serial connection (which is already planned by WAPDA) could counteract this trend.

Comparing the data from WAPDA/GTZ (quoted by IUCN 2003:16) and the survey by GoP (quoted by CLEMENS 2001:41) with the data collected in spring 2008, a huge increase in the usage of LPG can be identified. Nowadays, it is widely used and easy to handle, though more costly supplement to wood for cooking and to kerosene for lighting. Kerosene is still commonly used for lighting, but is increasingly used as a substitute for electrical power and LPG.

According to the perception of our interviewees, it is to be assumed that large amounts of wood are cut every year in the scarce forest areas of Shigar and processed to firewood resulting in severe forest depletion. Serious consequences might occur to the communities in the rural areas if existing alternative energy sources for heating and cooking will not be generated and used more efficiently. To decrease firewood consumption more efficient stoves could be introduced. At the same time, indoor pollution caused by traditional cooking facilities could be reduced. In long terms, it would be advisable to replace wood and dung with other sources of energy such as electricity, LPG and kerosene. Aside from preserving the remain-

ing ecosystem and using dung as a fertiliser on the fields, another positive effect would be the saving of time. People could carry out more productive labour which could lead to an increasing productivity and a better quality of life in general.

5. Irrigation in Shigar

Svenja Dieckhoff, Nicole Wegner

5.1 Introduction and research question

Shigar is located in an arid high mountain region where the annual precipitation in the valleys is extreme low. Under these conditions, agriculture is not possible without irrigation systems which make use of the perennial glacier fed streams of the side valleys. Sofisticated networks of canals distribute the scarce water over the alluvial fan and thus provide the precondition for agricultural production. The complex challenge of water distribution and frequently necessary maintenance works in the canal network constitute the need for a common water management system in every oasis (cf. KREUTZMANN 2000a). The organisational and institutional patterns of water management systems are characterised by stability and dynamism. Especially the irrigation system always faces the challenges of adaptation when natural hazards and societal transformations require amendments. Our task was to investigate changes during the last decade in comparison with Schmidt's field study in 1997 (SCHMIDT 2004a). Modifications were expected in the physical canal system (e.g. techniques, mechanisation, location, size or names), in the institutional and management structure (e.g. construction and maintenance work or operation) and in the legal regulations or rather customs of water use.
Since Shigar Proper still is a water surplus area and the irrigation system appears to be stable, only few significant changes have been found. Moreover, the projected analysis of water-related conflicts had to be placed back as it turned up to be a sensitive issue to talk about. The focus of our research has been extended to gain a deeper understanding of the irrigation system of Shigar as a whole.

5.2 Methods applied

Data on the on-site distribution of the canal network have been collected through observation and GPS supported mapping. Observation has been instrumental also in learning about the technical functionality and operation.
Additionally, focused interviews with water users and local experts, e.g. land assessor (*patwari*), revenue administrative officer (*tehsildar*), village elders (*tsharma*), canal watchmen (*hrkong-pa*) and a District Council member have served to gather in-depth information. In order to compare the water availability at the upper side and lower side of the main canals, water users from both areas were interviewed. In total 25 interviews have been conducted, twelve each in Markunja and Marapi plus one with a member of the Shigar Town Management System (STMS).

5.3 Results

After giving brief introduction into the hydrological conditions of the area, the physical irrigation network is described. Concerning management, main aspects of the legal documents and oral traditions are summarised. Existing distribution ratios and rotating systems, as well as responsibilities for construction and maintenance work for the different main canals are exemplified in tables. Next to that, financing of the irrigation system and disputes occurring

among water users are explained. A flow chart shall visualise the institutional structure. Finally, this chapter presents changes and new findings, whereby the former have taken place during the last ten years, while the latter have existed earlier but have not been recorded until recent fieldwork.

5.3.1 Introduction

Agricultural land utilisation in desert steppes-zone like in Shigar Valley requires a well functioning irrigation system (cf. KREUTZMANN 2000a). This depends among others on the availability of meltwater from the catchment area above Shigar. The respective catchment area for Shigar Oasis is the largest in Shigar Valley and covers 209 square km (SCHMIDT 2004a:186). As it is shown in Figure 5.1 it consists of glaciers and snowfields.

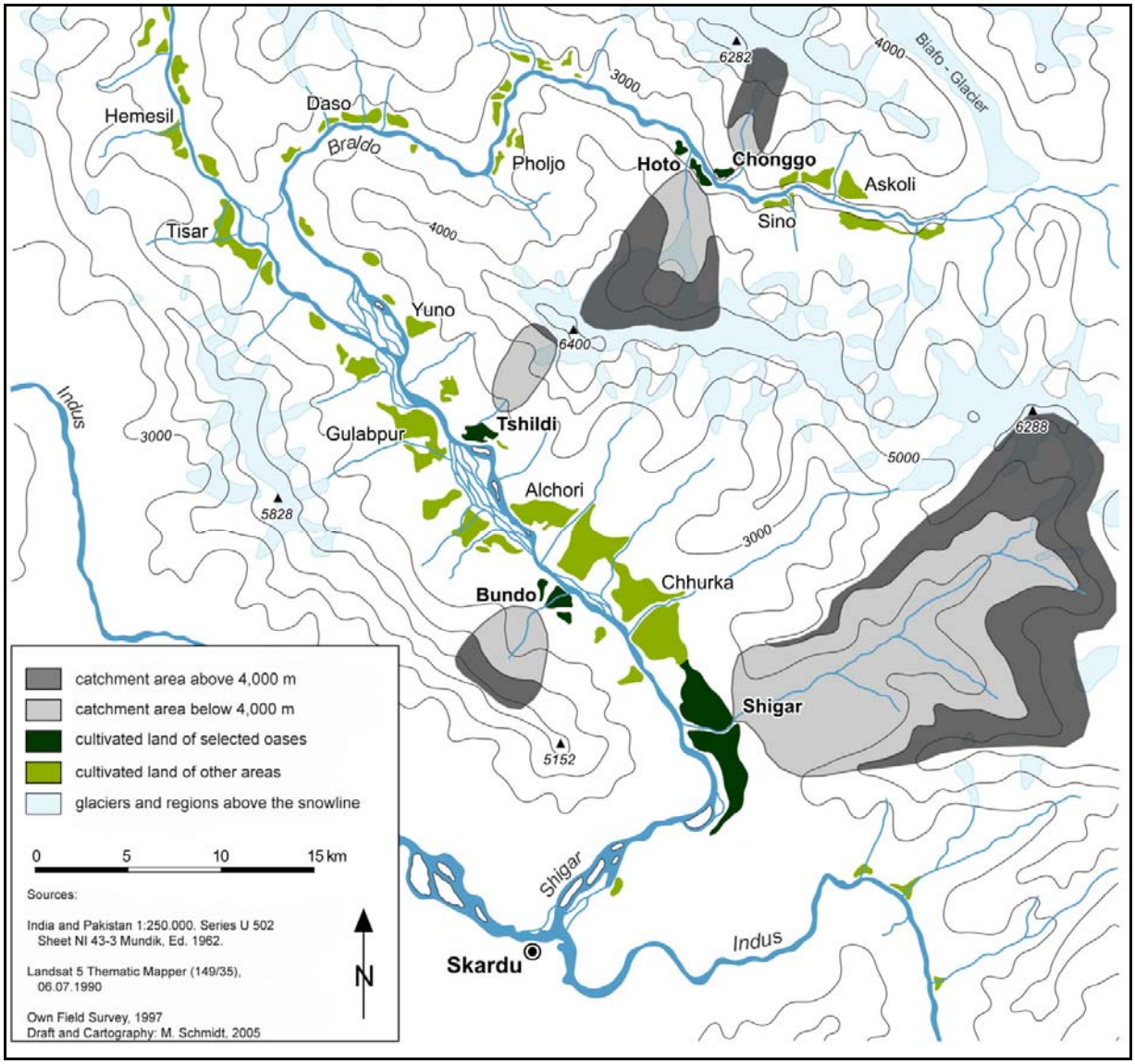


Figure 5.1 Catchment areas in Shigar Valley
Source: SCHMIDT 2004a.

Meltwater is extracted from the nālā and distributed to the fields through an old established system of open canals (*hrkong*, *hrka*), which follow gravity. Water from the main Shigar River itself remains untapped so far. Seasonal and daily fluctuations of water supply are caused by

annually varying snow and ice accumulation during winter, as well as seasonal and diurnal changes in temperature, insolation, sky cover, and albedo, which in turn affect the amount of discharge during irrigation season (DERBYSHIRE, FORT & OWEN 2001; KOLB 1994; HASERODT 1984, 1989). The water management for agricultural irrigation in Shigar starts in March and terminates in September.

5.3.2 Physical irrigation system

The administrative structure of Shigar differs from the irrigation structure, with the latter being strictly divided alongside the *nālā*. According to this, the irrigation area of Marapi is located to the south of the *nālā*, whereas Markunja's water user group is north of the *nālā*. Additionally, Doropa, a hamlet at the very north of Shigar oasis that administratively belongs to Union Council Chhurka, receives water from Shigar *nālā*.

The total canal network consists of nine main canals: Three in Marapi (Kothang-Hrkong, Marapi-Hrkong, Kyahong-Hrkong) and six in Markunja (Shargua-Hrkong, Khachoni Sari-Hrka, Gongyur-Hrkong, Chhogho- or Gamba-Hrkong, Sheikhpi-Hrka, Bunpi-Hrkong) (Figure 5.5).

Two different irrigation techniques (cf. KREUTZMANN 2000a) are being used in Shigar. Root and tuber crops are cultivated through furrow irrigated parcels *(wa)*, and grain crops and most vegetables through border irrigation *(hnang)* (Figure 5.2 & Figure 5.3)

Figure 5.2 Border irrigation.
Photo: Dieckhoff 2008

Figure 5.3 Furrow irrigation.
Photo: Dieckhoff 2008

Figure 5.4 Sediment trap filled with water.
Photo: Dieckhoff 2008

Sediment traps are located along the main canals and are required to prevent the canals from silting. These need to be cleaned frequently (Figure 5.4).

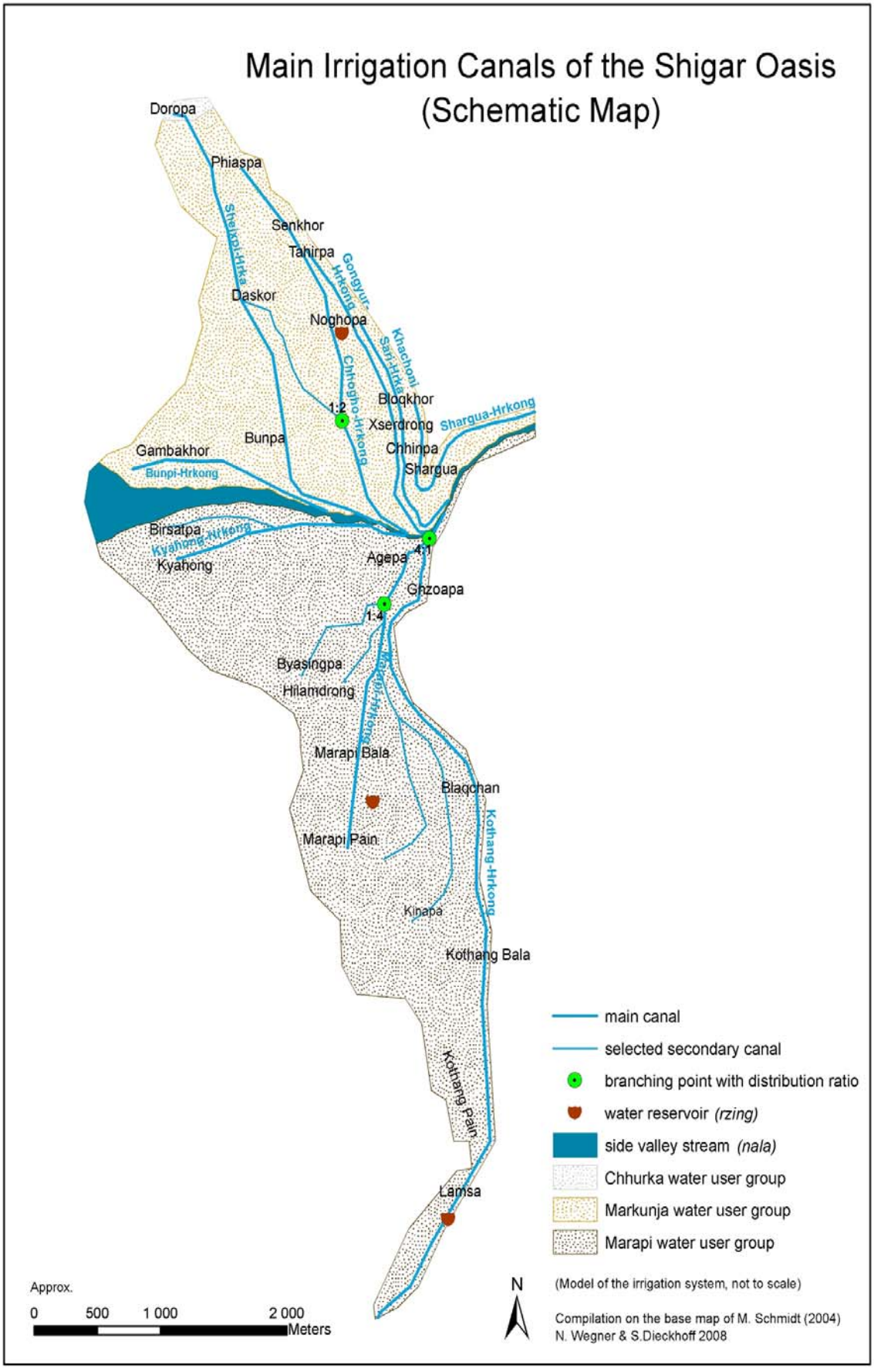


Figure 5.5 Main irrigation canals of the Shigar Oasis

5.3.3 Water rights documents and oral tradition

Although Shigar is a water surplus area, complex management strategies have been established in former times in order to operate the communal irrigation system effectively and sustainably, so that resources are not depleted. Management of the canal network and water utilisation are regulated by local institutions: Rules and customs on withdrawal of water and maintenance, as well as organisations that administrate and control them (cf. KREUTZMANN 2000a). These are fixed in written form in the water rights documents and through oral arrangements. Traditional customs regarding water management originated in pre-Dogra time and have been stipulated in written form in the legal documents on water rights (*revaj-e-abpashi*) during land settlement in Baltistan by the Administration of Jammu and Kashmir in 1901 and 1911 (SCHMIDT 2004b:321). These documents, defining water related rules and regulations are kept in original at the local administration department (*tehsil* office). They describe for each village (*mauza*) the main canals, the distribution ratio, rotation system, and responsibilities for maintenance.

Only very few people in Shigar have ever consulted the documents. On the one hand, reading them is impeded by the low literacy rate of 16.4% (IUCN 2007:14). Other constraining factors are also the document's illegibility and the ancient Urdu script that hardly anyone can read. On the other hand however, people see no need to take a look at the water rights since its rules and regulations are applied practically in everyday farming. Oral traditions are common in all aspects of life which affect the community life. Therefore, knowledge is transferred and adjusted from one generation to the next. This occurs through learning from elder relatives or local authorities such as village elders and *patwaris*. The village elders and elected members of the Union Councils consult the water rights documents only in cases of disputes via the local *tehsildar*. Although the water rights have been retained unchanged and are still effective to these days, not a single second copy exists and deterioration is imminent.

5.3.4 Distribution ratio and rotating system

Mainly due to the implementation of distribution ratios and rotation systems along certain main canals, Shigar is having sufficient water during irrigation season. There are restrictions in amount of water and time of availability, which differ among hamlets. While the distribution ratio apportions the share of water for some canals, the rotation system regulates the period of time during which the respective main canals and hamlets are allowed to extract irrigation water from the canals. The water allocation is determined by the size of the fields and the time needed for flooding.

The distribution ratios and rotation systems for the different main canals in Markunja and Marapi are summarised in Table 5.1. Figure 5.5 specifies the location of the branching points where distribution ratios are in force. Abidance of these restrictions is mostly controlled by the water users themselves.

In addition to the rotating system for the hamlets along the main canals, another rotation system exists. This refers to the water allocation to the field parcels and is carried out pursuant to the principle of "first come – first serve" or "upper field first".

In Shigar, the shares of water running through certain main canals are measured through predetermined sizes of stones. The smaller the stones, the less water is flowing into the ca-

nal. The stone sizes range from yak-head, cow-head, sheep-head, and one-kilo stones. Smaller stones are used to close the canals completely.

In periods of severe water shortage the scarce water resources are used in a preferential manner. Accordingly, crops are ascribed the highest priority, followed by drinking water for cattle – as they can be brought to Shigar River –, orchards and meadows.

Table 5.1 Distribution ratios and rotating systems for main canals in Markunja and Marapi *

WATER USER GROUP / CANALS		DISTRIBUTION RATIO	ROTATION SYSTEM AMONG HAMLETS
MARKUNJA	Shargua-Hrkong	none	note: canal is used mainly for plantation and for some cultivated land Raja's Plantation: Fri **Shargua**: every night **Chhinpa**: Sat-Sun **Xserdrong**: Mon-Tue **Bloqkhor**: Wed-Thu
	Khachoni Sari-Hrka	n/a	n/a
	Gongyur-Hrkong	none	**Xserdrong to Bloqkhor**: daytimes exc. Fri (**Chhinpa to Bloqkhor** 7 days/week)[1] **Noghopa**: 7 nights/week **Tahirpa**: Fri 8 a.m.- 4 p.m. and 7 nights/week
	Chhogho-(Gamba-) Hrkong	1 part: **Daskor** 2 parts: **Noghopa**, **Tahirpa**, **Senkhor**	**Noghopa**: n/a **Tahirpa**: n/a **Senkhor**: 6 hrs daily (9 a.m. - 3 p.m.)[1] + whole night **Phiaspa**: 4 days/week[2] **Daskor**: n/a
	Sheixpi-Hrka	none	**Phiaspa**: 4 days/week[2] **Doropa**[1]: Whole day: 4 households on Sun + 4 households on Mon; 10 a.m. - 3 p.m. + night note: Administratively, Doropa belongs to Chhurka. It also gets water from Chhurka *nālā* (8 a.m. - 2 p.m. daily exc. Fri)
	Bunpi-Hrkong	none	None
MARAPI	Kothang-Hrkong	near canal head: 1 part: **Kothang** 4 parts: **Marapi**	**Ghzoapa to Blaqchan**: 4 a.m. - 9 a.m. and 3 p.m. - 4 a.m. **Blaqchan to Lamsa**: 9 a.m. - 3 p.m. **Lamsa**: Fri only; no restriction; but water available at night only
	Marapi-Hrkong	near canal head: 1 part: **Kothang** 4 parts: **Marapi** At Marapi-Hrkong: 1 part: **Byasingpa** 4 parts: **Marapi**	**Agepa to Hilamdrong**: 4 a.m. - 9 a.m. and 3 p.m. - 4 a.m. **Hilamdrong to Marapi Pain/Kinapa**: 9 a.m. - 3 p.m. **Marapi**: 10 p.m. - 4 a.m.[1]
	Kyahong-Hrkong	none	no restriction

* Data: Survey by Dieckhoff & Wegner 2008; compiled on the basis of interviews with water users and local experts

[1] Or, 10 a.m. - 4 p.m according to a differing statement by another water user.

[2] Not specified if timing applies to Chhogho-Hrkong and Sheixpi-Hrka or only to one of them.

5.3.5 Construction and maintenance

As stated earlier, responsibility for construction and maintenance of the canal network is determined in the water rights documents.

Singular and episodic tasks are carried out collectively by all hamlets along the main canals. In general, one male member of every household has to attend. If not complying with this rule the household will be sanctioned. Work includes cleaning and repairing the *nālā* and canals annually after winter, constructing or improving the canals once in a while, and in case of natural hazards mobilising help. More regular activities, such as maintaining the canals, checking that the discharge is not impaired, and removing accumulated sediment load are mostly assigned to the last hamlets of the main canals (Table 5.2). Here also, the respective households have to provide one male labourer. Only in case of emergency, such as torrential floods causing serious damage to the canal network (SAID 1998), more than one person per household from all hamlets has to help.

Some hamlets, e.g. along Gongyur-Hrkong and Marapi-Hrkong, nominate a canal watchman (*hrkong-pa*) who is in charge of controlling the functionality of the canals and checks for damages along the canal heads (Table 5.2). On a daily basis, they do small repairing, regulate water flow to prevent damage and alert the community in case of emergency. All households pay an appointed amount of grain to the watchman.

Table 5.2 Construction and maintenance for main canals in Markunja and Marapi *

WATER USER GROUP / CANALS		CONSTRUCTION / MAINTENANCE WORK
MARKUNJA	**Shargua-Hrkong**	responsibility: **all hamlets** using Shargua-Hrkong
	Khachoni Sari-Hrka	n/a
	Gongyur-Hrkong	watchman doing small maintenance work according to needs (no supervisor)
	Chhogho- (Gamba) Hrkong	responsibility with last two hamlets: **Senkhor, Phiaspa**
	Sheixpi-Hrka	cleaning before May / after Aug: **all hamlets** along Sheixpi-Hrka responsibility during season with last two hamlets: **Phiaspa, Doropa** villagers noticed a slight decrease in attendance rate during last years due to side jobs no watchmen, all people in charge of controlling efficiency
	Bunpi-Hrkong	responsibility with last hamlet: **Gambakhor** no watchman, all people in charge of controlling efficiency
MARAPI	**Kothang-Hrkong**	in the beginning of the season **all villagers** along Kothang-Hrkong help responsibility during season with last hamlets (**Kothang Pain, Kothang Bala**); exc. **Blaqchan**: responsible for their canal section only, but: if Blaqchan is not performing their duty, Lamsa people work & get paid (100 Rs) in case of emergency: **Lamsa** in charge of mobilising people from hamlets up to Blaqchan
	Marapi-Hrkong	responsibility with last hamlets: **Marapi Bala, Marapi Pain (Kinapa)** watchman: daily control, small maintenance work, informing people watchman supervisor: administrating penalties & supervising watchmen caretaker during winter (elected): in charge of distributing small discharge

* Data: Survey by Dieckhoff & Wegner 2008; compiled on the basis of interviews with water users and local experts

5.3.6 Financing

For maintaining the irrigation infrastructure funds are needed. There are three options: First of all, the government allocates annual contributions to the local government, but does not implement any irrigation projects directly. Both Union Councils in Shigar receive a lump sum for diverse community issues, such as education, health, irrigation, etc. The available amount is then redistributed according to needs and priorities. In case of emergency the villagers can request for special funds. The government funds also serve for financing construction work through local contractors.

Further revenue is generated through monetary penalties that are levied if a household neglects its duty to attend maintenance work. Fines amount from 50 Rs up to 150 Rs. If a household cannot pay or denies paying valuable things are collected from their house (e.g. firewood, cookery, pots or grain) and are sold if the household cannot procure money within a few weeks. The same holds true for the watchmen and supervisors. As traditional authorities they are accountable to their community and may be sanctioned also, in case of neglecting their duty.

Another source of capital is collecting money from the villagers on a voluntary basis or even by force, particularly in case of emergency.

Penalties are administered in different ways. The fine may be governed by a single person, such as a village elder or a watchman or even deposited in a community account.

5.3.7 Disputes

Although less frequent, reasons for disputes concerning irrigation are: not abiding to traditions and rules, e.g. opposing to allocated time restrictions or water theft.

The duration of settling a dispute depends on case and scope. In the majority of cases, disputes are settled on the spot within a few hours by the community or rather with the counsel of local authorities, such as village elders.

Bigger disputes are brought to the *tehsildar* through oral application, and resolution might take several days. If the case cannot be decided easily written application is required and might be taken to court in Skardu. But as far as the local experts could remember, legal proceedings in Shigar Valley were necessary for one conflict only, which was in Chhurka.

As a matter of course, after settlement of disputes relationships between parties involved depend on the character of persons involved. But in general, communal life is not affected afterwards. In a small oasis such as Shigar, people depend on community and efforts are made to cooperate.

5.3.8 Institutional structure

The irrigation system in Shigar involves different stakeholders of the local community like water users, watchmen or the local government, some of which are discussed above. However, national government and also NGOs are playing supportive roles in the management of irrigation. Figure 5.6 shows the main relationships between specific stakeholders and their interaction with the physical irrigation system.

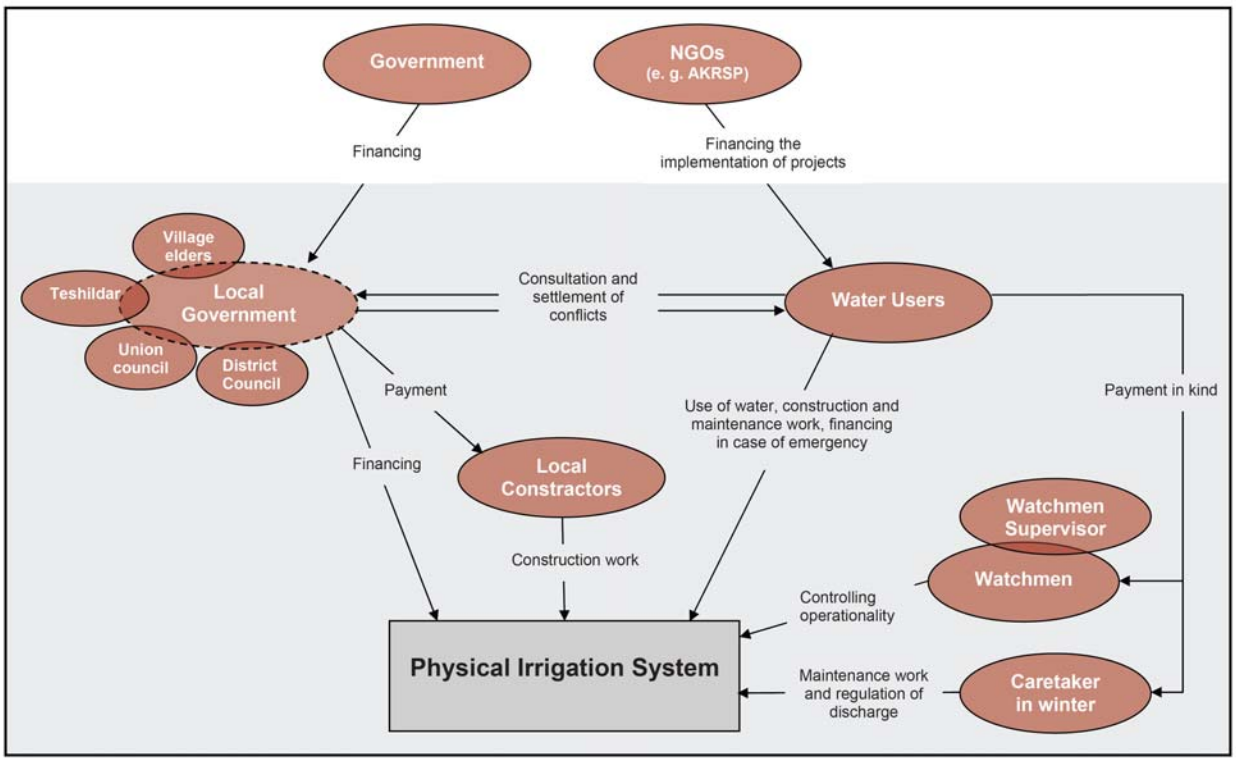


Figure 5.6 Stakeholders involved in the irrigation system of Shigar
Design: Dieckhoff & Wegner 2008.

5.3.9 Changes and new findings

While changes are understood as innovations that have been introduced within the observation period, new findings were brought in more than ten years ago but were not recorded in the study of SCHMIDT (2004a).

Figure 5.7 Stonewalls at the canal head of Kothang- and Marapi-Hrkong
Photo: Dieckhoff 2008

Even though no further evidence was found with regard to the legal documents and oral tradition, the organisational level as well as the physical system shows interesting aspects:

Changes in the physical system are related to improvements in construction in order to prevent destruction from episodic flooding. About three years ago, the *nālā* walls and some canal heads along the *nālā* have been reinforced with wired stone walls (Figure 5.7). Local government provided financial support for this enterprise.

Additionally, sections of the canals have been cemented for erosion resistance. Some canal heads had to be reconstructed and have changed their position due to damages from flood, e.g. Bunpi-Hrkong and Sheixpi-Hrka (Annex A, Map 1.1).

With regard to the organisational structure, changes were noticed in financial matters. In the past, penalties were paid in kind only, nowadays usually money is claimed. In spite of the monetary requirements, value has not changed and the amount of the fine levied equates to the current price of a chicken or goat. Furthermore, local experts asserted that budget allocated for irrigation by the local government has risen noticeably. Reasons given were the

increase in prices and needs. As a consequence, wage work has also risen because of local government funding. Activities, which have been done jointly by the community in the past, are nowadays partly performed by local contractors who are paid by the local body. This in turn, as few villagers, in particular along Sheixpi-Hrka noticed, brings about a slight decrease in attendance rate during maintenance work. Absenteeism is also justified by time restrictions due to taking up jobs aside from farming.

Figure 5.8 Filled water reservoir between Marapi Bala and Marapi Pain
Photo: Dieckhoff 2008

Three water reservoirs (*rzing*) and two other main canals, which exist since indeterminate time, complement the physical irrigation system (Figure 5.5, Annex A, Map 1.1).
One water reservoir is situated in Noghopa in Markunja and two in Marapi, more precisely in Lamsa and between Marapi Bala and Marapi Pain (Figure 5.8).
This kind of infrastructure enables the storage of water in particular during night and in times of irregular water supply and eases water distribution. The reservoirs are about 4 to 8 ft deep and up to 50 ft long. The main canals Shargua-Hrkong and Khachoni Sari-Hrka are located in the easternmost border of Markunja and supply irrigation water to the hamlets Chhinpa, Xserdrong, Bloqkhor, Shargua and partly to Noghopa.

5.3.10 Challenges and recommendations

Although irrigation in arid mountain regions proofs to be a well-established and sophisticated system (cf. KREUTZMANN 2000b), in Shigar certain challenges or rather shortcomings are noticed by the water users and single authorities:

- Seasonal water shortage affecting villages at the lower parts of the main canals,
- seapage in the canals causing considerable water loss,
- sedimentation affecting discharge,
- natural hazards, e.g. floods, landslides, causing damages mainly at canal heads,
- poor condition of water rights documents and lack of interest by government,
- lack of monetary resources.

As a result, following recommendations for improvement arise:
For more efficiency in water use:

- Constructions to prevent emergency situations (e.g. strengthening canal heads and *nālā* walls),
- protective measures to prevent seepage (e.g. sealing canals),
- more attention to be paid to the hamlets at the end of the canals according to their share (i.e. equal water distribution and management among villages).

Preservation of the village heritage:

- Historical documents,
- traditional management strategies and utilisation practices,
- cultural landscape.

5.4 Conclusion

The management of irrigated agriculture varies in the Northern Areas as it depends much on the specific physical conditions as well as the respective social and historic background. Therefore, a general assessment respectless of location cannot be made (FAZLUR-RAHMAN 2000:66, 2007; STOEBER 2000:73). Nevertheless, the major common feature regarding irrigation practice is the autochthonous and long standing way of managing and operating the limited water resources as communal effort through a sophisticated system of social institutions (KREUTZMANN 2000:96). This in turn contributes to a strengthening of the community ties by producing interdependence among water users (LABBAL 2000:181).

This study shows that the community-based irrigation system of Shigar oasis is functioning to the present day in organisational and technical terms. Although transformation of mountain societies is perceivable regarding the way of living and socioeconomic structure (FAZLUR-RAHMAN 2000:82), the impact on resource management strategies is low. The irrigation system of Shigar oasis remains rather stable and therefore, proofs to be sustainable.

The utilisation rights, including the water rights documents and customary laws, are for the people to rely on. Despite perpetuity of the legal documents and oral traditions, dynamism is noticeable in the organisational structure. This concerns particularly the increasing monetarisation of services in the irrigation sector, e.g. through government funding, wage work, and penalties in cash. This kind of monetary management of communal water resources indicates the transformation in mountain societies.

6. Water management: Drinking water access in Shigar

Jana Landschulze & Franziska Voss

6.1 Introduction and research question

The following chapters deal with the issue of access to clean drinking water in Shigar. Although, from a quantitative perspective, there are sufficient water sources in the environment of Shigar (glaciers, springs, the *nālā* and the Shigar River), the limited access to clean drinking water poses a problem of considerable extent, not only in Shigar but also in the Northern Areas in general. Even though, in a case in 1994, the Supreme Court of Pakistan has decided that the "right to have unpolluted water is a right of every person, wherever he lives" (ROSEMANN 2005:15), polluted drinking water still seriously affects the health situation in many parts of the country. Diseases closely related to unsafe drinking water, such as diarrhoea and dysentery, entail 20 to 25% of deaths of children under the age of five (HALVORSON 2003:124).

Given these interrelationships, different water supply systems (WSSs) present in Shigar have been observed with regard to the organisation of the water infrastructure, its use and other relevant drinking water sources. At the same time, the local inhabitants' perspective on the drinking water issue and the WSSs play an important role in this report. The most essential sources of drinking water are water taps, which are installed in public places in every hamlet. After giving an overview of the individual supply systems, this chapter deals with the quantity, spatial distribution, and physical condition of public water taps, and with the resulting inequality of access to drinking water between different settlement areas of Shigar. Subsequently, the issue of other drinking water sources will be addressed, regarding the distribution and terms of use, as well as the differences between individual hamlets. The final part of the study is dedicated to the aspect of water quality and its impact on the health situation.

6.2 Methodical implementation

The methods primarily used by the research team involve mapping, observation, and interviews with local people and experts. For determining the number of water taps and, even more important, for the analysis of the physical condition of the taps and the current water availability, systematic and structured observation formed the main method applied. Interviews provided additional information about daily or seasonal availability of water (especially in winter). Furthermore, in order to get a comprehensive overview of the entire situation and to be able to compare the different hamlets with respect to the availability of tap water, many interviews were made with the tap users themselves. Referring to this, the highest possible representativeness has been obtained through the selection of locations and taps where these interviews were conducted. This approach guarantees the reliability of recorded data with regard to the overall situation in the hamlets.

A further crucial part of the interviews concerned the use of alternative drinking water sources in case of insufficient water availability. This method also provided information about taps and areas of the hamlets that were not directly covered by interviews.

The research team has surveyed alternative sources of drinking water and has interviewed the users about their habits of use. In this respect, data obtained by the general household survey has been integrated as well. Interviews carried out with shopkeepers at the bazaar produced additional information about the use of the so-called “bottled water”.
For evaluating the water quality, tap water of the general WSS and of one *chudong* was tested on the occurrence of coliform bacteria, by the use of simple qualitative water tests[5] . In addition, the local people were interviewed about their own perception towards the water quality.
Interviews made in two medical stores and at the Rural Health Centre provided information about the frequency of water borne diseases.

6.3 Water supply systems

It is important to distinguish three individual operators that have implemented public water supply schemes in Shigar. The Northern Areas Public Works Department (NAPWD) provides by far the greatest part of the pipe water systems in the area of research. Additionally, 64 households in the hamlets Xserdrong and Agepa as well as in the Shigar Fort area have received a separate WSS by AKCSP. Moreover, AKCSP has provided additional public water taps at the bazaar (in Agepa, Chhinpa and Halpapa). Within the scope of the Water and Sanitation Extension Programme (WASEP), water supply in the south of Marapi has been implemented and tap water is available now. Figure 6.1 illustrates the quantitative proportion of water taps according to the different operators.

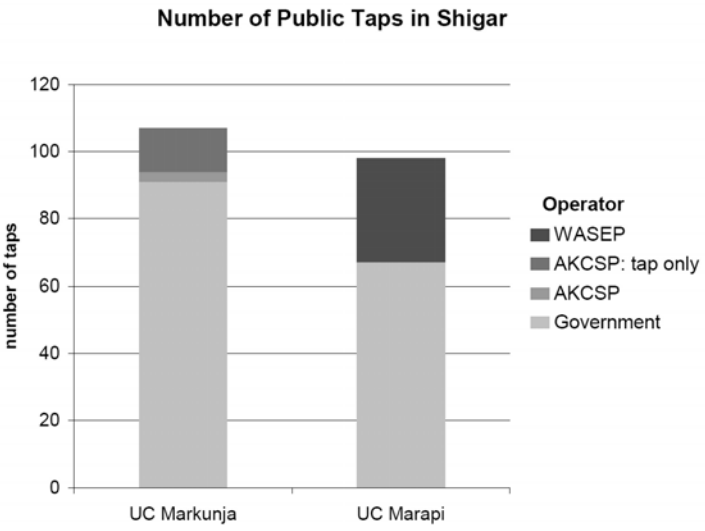


Figure 6.1 Number of public taps in the Union Councils of Shigar
Data: Survey by Landschulze & Voss 2008

6.3.1 General water supply system

The state-owned WSS, whose installation already started in the 1960s, is under the responsibility of the Water and Power Department (WPD)[6]. The water partly origins in a spring at the upper reach of the *nālā*. The spring is unprotected and is situated below the pasture areas and seasonal settlements. The major part of water comes from the *nālā* itself. The intake point at the *nālā* is situated slightly below the power station, i.e. within the settlement area (Figure 6.2)

[5] Qualitative tests do not measure the concentration of bacteria, but indicate the presence or absence of bacteria.

[6] WPD is a subdivision of the NAPWD. WPD has a branch in Shigar also.

From there, pipelines with a diameter of 4“ lead the water into two tanks, which are located slightly above Shigar Fort. The tanks supply Markunja and the northern part of Marapi on the one side, and the rest of Marapi on the other side via two main pipes. Through pipelines of varying diameter (3“, 2“, 1“, and ½“), the water reaches the individual hamlets, and the public water taps and houses respectively (Figure 6.3). Both, supply and use of the taps are free of charge.

Figure 6.2 Intake point at the *nālā* for the water supply system in Shigar
Photo: Landschulze Apr 2008

Due to problems with corrosion, new pipes made of plastic material recently replaced the major part of the steel-pipes. According to information by the WPD, in 2006 6.5 million Rs were invested in the new pipes.

Although the implementation of the WSS in Shigar can be considered as big improvement in the drinking-water accessibility, the pipe system suffers from heavy shortcomings concerning its conception as well as its construction. The conceptual shortcomings are caused by the fact that there is simply no existing concept. The system has been and still is being extended according to local demand and availability of the materials required. Extensions are carried out by the WPD itself, e.g. in order to connect new areas of the village to the system, or on initiative of individuals who want to be supplied through private access in their house[7]. Since the implementation of WSSs in the Northern Areas is usually carried out in a top-down-manner there is little participation of the people (HUSSAIN & LANGENDIJK 1995:51), and also a lack of communication regarding the functioning and use of the system.

In general, maintenance does not work very well. One reason is the lack of financial and personnel equipment of WPD in Shigar. The latter counts five employees in total, of which only three are responsible for the maintenance of the whole pipe system. To guarantee a sufficient maintenance, 15-20 employees would be necessary, according to information by WPD.

Due to the fact that the water has its origin in a glacier, it shows high sediment contents. Especially in the season of increased glacier melt, beginning in March/April, this leads to turbidity and to a green colour of the water (chapter 6.7). No filtration or treatment is provided for the water entering the system.

In 2006 the capacity of the water tanks has been increased, and more importantly, additional *nālā*-water has been led into the system. According to statements of many local people, this results in a decreased water quality on the one hand, but on the other hand entails an increased reliability of water supply.

6.3.2 WASEP

Almost all existing water taps in Lamsa, Bukyalpa, Bashopa, and Malakhor have been provided by WASEP. The project that led to their installation was carried out in 2002. Its implementation comprises also education about hygiene, functioning and maintenance of the system. The water origins in the ground water sources in the riverbed of the Shigar River. An electric pump station transports the water into a filtration plant above the settlement area.

[7] In this case, the respective person has to bear the costs for the installation.

Having passed this filter, the water is distributed to the respective taps through a pipe system. The number of taps is almost proportionate to the number of households, so that generally, every household has a separate water tap at its disposal.
Responsibility for this water system is allocated to the local community. A monthly fee of 100 Rs paid by every household, guarantees the functioning and maintenance of the system, including the running of the pump-station and filtration plant, the maintenance of the tank, pipes and taps, as well as ordinary repairs. The major part of the costs is caused by the energy supply for the pump-station. Due to the general rise of energy costs (chapter 4) and inflation, the fees have quintupled since installation of the system (from 20 Rs at the beginning to 100 Rs nowadays). Therefore, the pump station is only in short-term operation, i.e. drinking water is available for one hour per day only. During this time segment, people collect water, and store it in plastic cans and metal pots for the following day. Due to the reliability of the system, this proofs to be a practicable solution. The local people consider the amount of water to be sufficient. Also in winter, no severe problems seem to arise. The pipes are laid underground, and the taps themselves are surrounded by concrete casings to prevent freezing (Figure 6.4).
The local people assessed the water quality as excellent. Other sources of drinking water are not used anymore. And all *chudongs* are abandoned.
The need for more extensive repairs can pose a considerable problem. A broken concrete casing e.g. cannot be repaired easily since the required materials are scarce. The worst case in this respect, which already occurred once, would be a broken turbine in the pump-station. The restoration would be far too expensive and could not be afforded by the community. Every household pays the usual amount of 100 Rs, and according to information of the local people no problems or conflicts have ever aroused on this issue.
The present example shows that regularity in water supply can be more important than higher continuity without reliability (chapter 6.4.2). The people living in the hamlets provided with WASEP-taps know that water flows every day regularly at the same hour, so they know when and how much water to store.

6.3.3 AKCSP

In total, 64 households in the hamlets Agepa and Xserdrong and the Shigar Fort area (Sningdrong) are connected to the filtration unit, which was installed by AKCSP.
Following the concept of ownership, only particular households were provided with direct water supply. The public water taps provided by AKCSP, which are treated in the present chapter, are an exception. The village community had to bear the costs for the installation of the taps. Yet, there are usually no additional costs coming up afterwards. At these water taps, drinking water is available the whole day except during the weekly cleaning phase of the filtration plant. Like in the WASEP-area, the pipes were laid underground to prevent freezing and they are isolated. The condition of the taps managed by AKCSP is altogether better than that of the WPD, whereby it has to be taken into consideration that on average they are newer.
As part of the Village Upgrading Programme in the project area, AKCSP installed public water taps in Halpapa, Chhinpa and Agepa, predominantly along the bazaar. However, these

are supplied by the state-owned pipe system. In Agepa und Xserdrong there are also governmental public water taps connected to the general WSS.

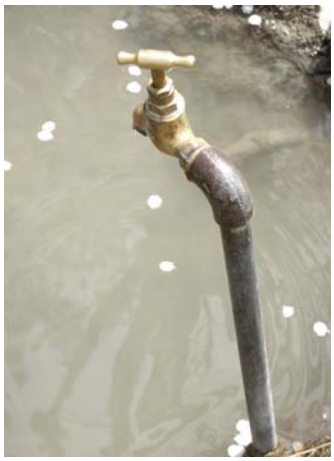


Figure 6.3 Water tap from WPD in Bloqkhor

Figure 6.4 Water tap from WASEP in Bukyalpa with broken concrete casing

Figure 6.5 Water tap from AKCSP in Agepa

All photos: Landschulze 2008

6.4 Public water taps

According to the household survey in Shigar, 69% of the households use public water taps. Therefore, these constitute the main source of water for the inhabitants of Shigar. There are differences in the number of households using an individual tap. The span reaches from one to 13 households - one specific public tap is even used by 25 households (Figure 6.6). In most cases, one to four households use one tap, so there seems to be a high number of public taps in some of the hamlets. Meanwhile, as more and more households gain private water access, the number of households, which use public taps continuously decreases.

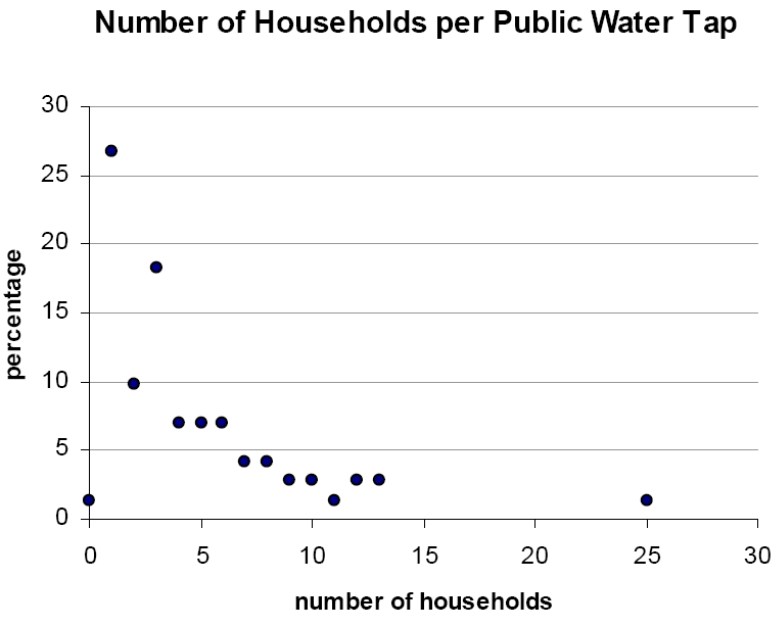


Figure 6.6 Number of households per public water tap in Shigar
Data: Survey by Landschulze & Voss 2008

Yet, there are differences between hamlets with regard to the number of the public taps and number of their users. The proportions given above do not give any evidence about the availability and regularity of water supply (chapter 6.4.2)

6.4.1 Physical condition of public water taps

During fieldwork, 185 water taps were analysed as to their physical condition. In doing so, the taps were assigned to three categories: Complete taps (Figure 6.7), taps without handle, which in nearly 75% of the cases implies that they cannot be closed (Figure 6.8), and

ordinary water pipes that come out of the ground without any tap at all (Figure 6.9). The quantitative proportions are given in Table 6.1. There is no interrelation discernible between the condition of the taps and their age, and no major difference between the two Union Councils has been found.

Figure 6.7 Complete and working tap in Gongma Xserdrong

Figure 6.8 Tap without handle in Agepa

Figure 6.9 Pipe without tap in Kyahong

All photos: Landschulze April 2008

All water taps working at the time of research have been checked regarding leakage. The majority of taps could not be entirely closed, could not be turned off at all, or showed leakage at other parts. In total, 38% of the seemingly functioning taps could not be turned off. Thus, 60% of the installations cause water losses due to their poor condition. In Marapi, the situation turned out to be slightly worse than in Markunja, whereas the result may possibly be distorted by disregarding the WASEP water taps, which were not included in the statistical evaluation (Table 6.2). About 17% of all installations showed makeshift repairs, which in most cases have been done by the inhabitants through means of applying textile patches, rubber and/or adhesive tape.

Table 6.1 Condition of public water taps (number and percentage of taps)

	MARKUNJA		MARAPI		
	Government	**AKCSP**[8]	**Government**	**WASEP**[9]	**Total in %**
Pipe without tap	23	3	21	0	**25**
Without handle	8	2	7	0	**10**
Complete	60	11	39	11	**65**
Sum total	**91**	**16**	**67**	**11**	**100**

Data: Survey by Landschulze & Voss 2008

[8] Including both categories of public taps constructed by AKCSP, those with and those without connection to the filtration plant.

[9] Among the 31 existing WASEP-built taps only eleven were checked.

Table 6.2 Functionality of public water taps (number and percentage of taps)

	MARKUNJA		MARAPI	
	Government	**AKCSP**	**Government**	**Total in %**
Not closable[10]	36	6	27	46
Leaking	11	2	8	14
Closable	33	7	21	40
Sum total	**80**	**15**	**56**	**100**

Data: Survey by Landschulze & Voss 2008

6.4.2 Reliability of water supply

Water availability at the moment of survey

At the time of survey, 56% of all taps provided sufficient water, while 8% provided only small amounts of water. Thus, these are of limited usability. 36% of the taps provided no water at all. Nonetheless, the taps that have been working, including those with small yields of water only, could be checked with regard to leakage and quality of water provided. Here, interviews were carried out with the users present during observation. Table 6.3 shows the rate of water availability of the examined taps at the time of survey. Thereby, the far less degree of availability in Marapi is striking.

Table 6.3 Water availability in April 2008 (number and percentage of taps)

	MARKUNJA			MARAPI		
Water availability	**Government**	**AKCSP**	**AKCSP: taps only**	**Government**	**WASEP**	**Total in %**
No water	16	1	2	23	31	36
Little water	9	-	-	8	-	8
Sufficient water	66	2	11	35	-	56

Data: Survey by Landschulze & Voss 2008

Figure 6.10 gives an inventory of all identified public water taps. Although this documentation aims at completeness, it cannot be excluded that a few, particularly mal-functioning taps are missing. With the exception of 20 WASEP-taps[11] in Lamsa, Bukyalpa, Bashopa and Malakhor, the operational state of the taps has been recorded in detail[12].

The number of taps is not necessarily related to the number of inhabitants. Taking into account the state-owned part of the infrastructure, considerable differences between the individual hamlets can be observed. To give an example, Gyanpa-Rupa has 13 taps at its dis-

[10] Also including pipes without taps that did not work during fieldwork, but which, according to interviews, are not permanently out of service

[11] Only eleven out of 31 taps were checked. At the time of visit, the pump station was out of service, so the taps could not be checked as to their operability. However, they are quite similar in construction, and the users affirmed that all taps operate as indicated in the figure.

[12] Additional private taps (usually located in orchards, in some cases directly inside the house) have been documented as well, and interviews were conducted concerning their usage.

posal, and according to IUCN counts 238 inhabitants, whereas in Kyahong with 518 inhabitants only four taps exist (IUCN 2007). In some hamlets, especially those with many newly-built houses, the low number of public water taps is compensated by the higher rate of household connections, e.g. in Rangakhor and Amburik.

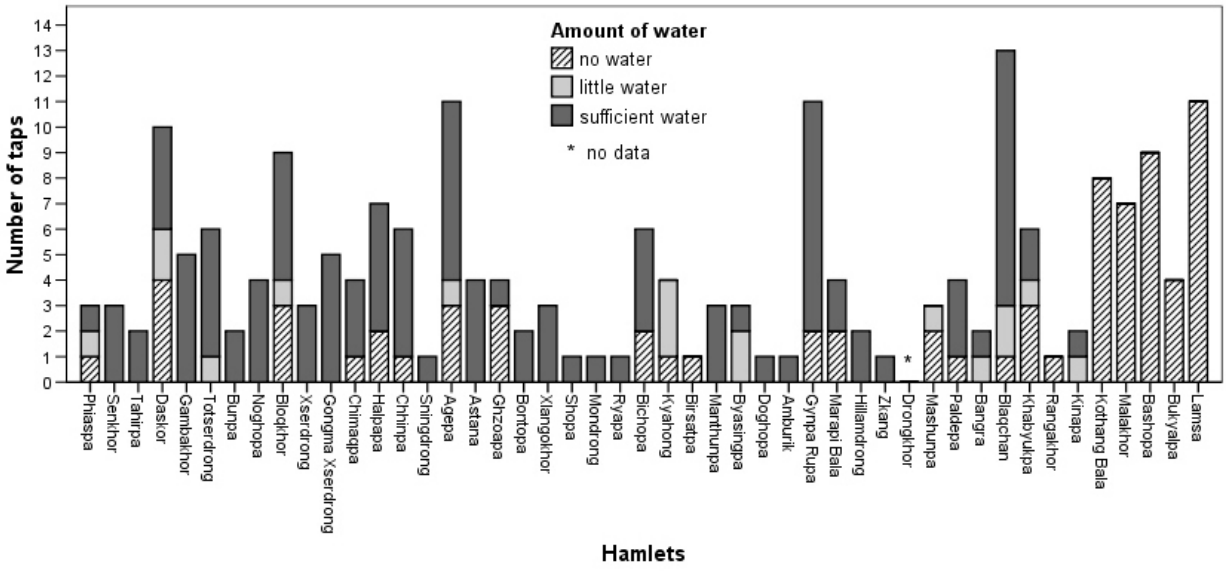


Figure 6.10 Water availability in April 2008
Data: Survey by Landschulze & Voss 2008

Regularity of water availability

Information about the general reliability of water supply is of greater significance than information on the current rate of water availability. These were recorded through interviews with the users.[13]

Table 6.4 and Figure 6.11 illustrate the results and give an overview of the regularity of water supply.

As illustrated in Table 6.4, the share of taps, which show irregular water supply only or no supply at all, is about 45%.[14] These taps are incapable of providing sufficient water and the users are forced to take water from the canals, the traditional water storage pits (*chudongs*) or from more remote water taps. The unreliability of water supply is caused by following factors: The capacity of the main tanks is too low and the high amount of wasted water, brought about by damaged taps and by insufficient instruction for the users, leads to an intensification of this problem. Also, damages at the pipes occur frequently, often caused by frost. The high sediment load of the glacial water, which enters the tanks and pipes without filtration, leads to their clogging. Often the blockages can be located with difficulties only, thus hampering the restoration works.

Especially the state-owned water taps show a rather irregular supply. This is true for approx. 75% of all water taps in Marapi and for 35% in Markunja. In the WASEP area, the water service is limited to one specified hour per day (Chapter 6.3.2), usually in the early evening. As to the taps of AKCSP, there are no service limitations (Table 6.4).

[13] Interviews on water availability have been carried out with regard to 112 out of 205 documented taps.

[14] Including taps of the following categories: ‘permanently out of service’, ‘irregularly, infrequently’ and ‘irregularly, often’.

Table 6.4 Regularity of water (availability of water in public water taps).

	MARKUNJA			MARAPI		
Regularity	**Govern-ment**	**AKCSP**	**AKCSP: taps only**	**Govern-ment**	**WASEP**	**Total in %**
Permanently out of service	6	-	-	5	-	**10**
Irregularly, infrequently	12	-	1	19	-	**28**
Irregularly, often	5	-	-	3	-	**7**
Regularly, daily	8	-	-	2	31	**37**
24h	10	3	1	6	-	**18**
Sum total	**41**	**3**	**2**	**35**	**31**	**100**

Data: Survey by Landschulze & Voss 2008

Specifying spatial disparities, Figure 6.11 presents the degree of reliability of selected taps in different hamlets. In this context, the number of running taps also includes taps that regularly show low supply only and which therefore are of limited usability (e.g. in Kyahong, where this is the case for all three functioning taps).

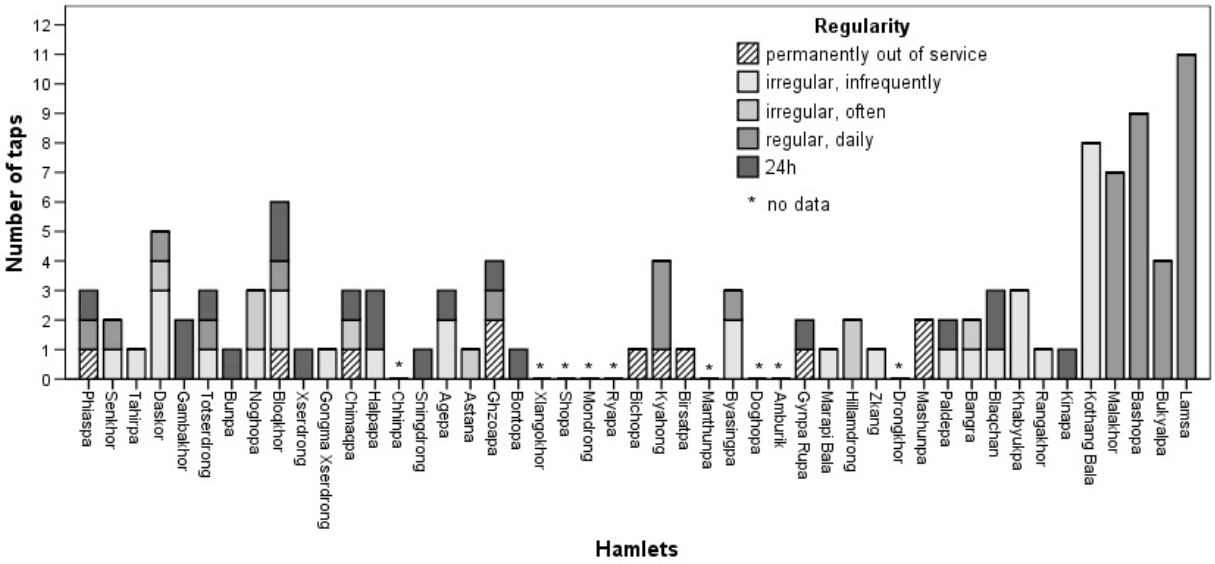


Figure 6.11 Regularity of water availability in different hamlets
Data: Survey by Landschulze & Voss 2008

Situation in winter

The situation in winter needs to be discussed in greater detail. Pipes often freeze and break, since they have been laid in insufficient depth or even above ground.[15] Moreover, they are

[15] In order to prevent the pipes from freezing, they have to be installed at least three feet underground or provided with insulation.

inadequately isolated. A particular weak point of the pipes is the part that sticks out of the ground: Pipes especially freeze at these points, a problem which people sometimes resolve by pouring hot water over the pipes. However, particularly because of the general scarcity of firewood in Shigar, this cannot be considered a proper solution (chapter 4). WASEP-taps are prevented from freezing by concrete casings around the pipe (Figure 6.4)

According to the interviews, 44% of the taps regularly run in winter,[16] whereas 46% do not. 10% of the taps work sometimes, but not regularly or do freeze at very low temperatures only. All taps of WASEP und AKCSP work in winter. Yet, within the group of the state-owned taps there are considerable differences. The most remarkable one concerns the two Union Councils: While 78% of the taps in Markunja do not work at all in winter, in Marapi only 20% of the taps are affected (including the WASEP taps, 39% without the WASEP taps) (Figure 6.13).

In case of a frozen main-pipe, usually all taps in a hamlet are affected because all of them are supplied by a single main-pipe. Irrigation canals and *chudongs* then are the only sources of drinking water.

Figure 6.12 shows the proportions between working and non-working taps in winter according to the individual hamlets. In most hamlets, there is rather restricted access to tap water in winter. Taking solely into consideration those taps that run reliably, i.e. taps that run without limitation or every day according to specified times, the situation is even more alarming, as illustrated in Figure 6.13.

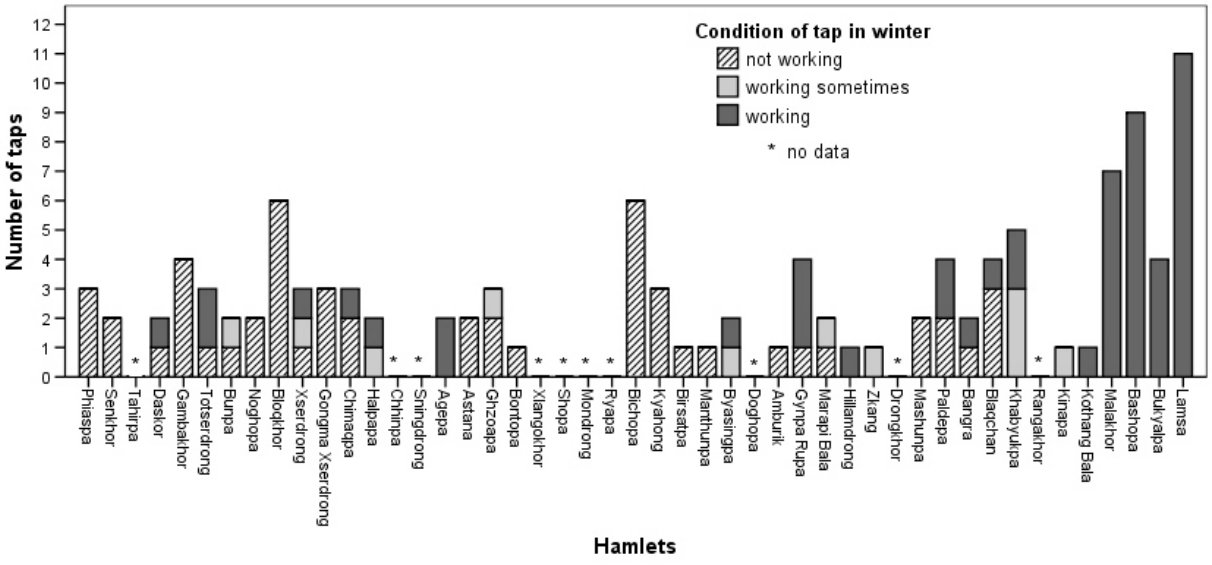


Figure 6.12 Water supply situation in winter according to the individual hamlets
Data: Survey by Landschulze & Voss 2008

[16] Information concerning the situation in winter could be gained through interviews on 115 taps.

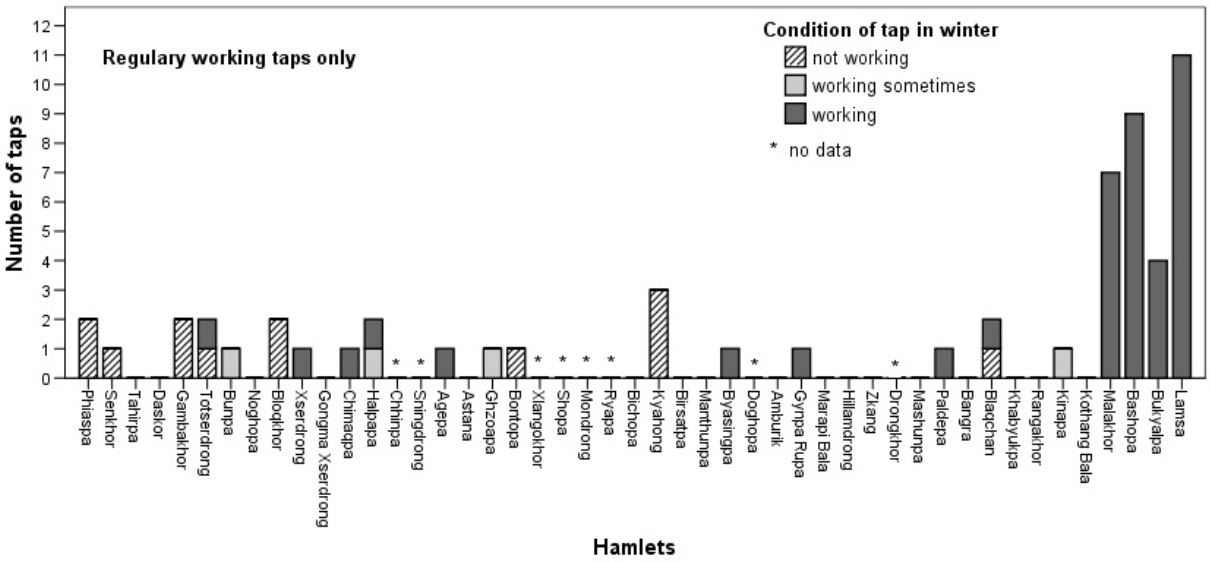


Figure 6.13 Regularly working taps: condition in winter
Data: Survey by Landschulze & Voss 2008

Box 6.1 Case study: Kyahong

In the large hamlet Kyahong with nearly 60 households, there are four public taps, one of which does not work, while another one only works sporadically. The remaining two taps work two times daily for one hour, providing little water only. The reason for this situation is to be sought in the diameter of the pipeline leading to the outlying Kyahong. It counts merely ½ inch, which usually is the kind of pipeline used for individual household connections. But in this case, a great distance is bridged by the pipe between the initial point at Bishopa and the taps. Additionally, in winter the two taps running in summer are also out of service (Figure 6.9). Therefore, the people solely have to rely on canal water, which is particularly problematic here because Kyahong is situated near the endpoint of Kyahong-Hrkong, where the pollution of the water is extremely high (chapter 6.7)

6.5 Private water taps

Some households in Shigar have a private water connection, particularly in newly built houses. House owners who want to get a private line have to pay for the required materials. Usually, the owner sets the connection himself after asking for permission at WPD.

In most cases, the pipeline leads to a water tap in the orchard, but some households also have a direct water supply in the bathroom and/or kitchen.

Many of these households face the same problems as public tap users in the surrounding, because the water comes mostly from the same main pipe. Thus, they are also affected by frozen pipelines in winter and bad water quality. In case of not functioning taps, these people likewise use canal water for drinking (chapter 6.7).

Although there is no exact data concerning the number of household connections, it is obvious that it increases drastically every year. Almost all newly built houses have a direct connection.

In the WASEP-area, as already mentioned, nearly every household has its own water tap.

6.6 Other sources of drinking water

Public taps constitute the most important source of drinking water for the majority of the inhabitants. As mentioned in chapter 6.4.2, the public taps do not function reliably and in few cases only, during the whole year. The following table gives an overview on which other sources of drinking water are used by the interviewed tap users (Table 6.5). Nearly half of the respondents stated that they use canal water for drinking amongst other sources. There are also regional differences detectable: Mainly in the north, people additionally use *chudongs*, while in other hamlets, most people use more remote public taps. And in some areas near the *nālā* or river, people use these sources as well.

Table 6.5 Alternative drinking water sources to public water taps

Drinking water source	Markunja	Marapi	Proportion in %
Canal	28	16	61
Chudong	9	1	14
Other taps	8	8	22
Nālā	1	1	11
River	0	1	1
Spring	1	0	1
No other sources	3	1	6

Data: Survey by Landschulze & Voss 2008; 72 respondents, multiple answers were given

6.6.1 Chudongs

Chudongs are traditional water storage pits, in which water from the irrigation canals is collected and stored for drinking. The walls, usually consisting of soil and clay, have one inlet and one outlet that can be closed or opened to connect the pit with the canal. The pit is usually covered with wood and clay, and in some cases with a flagstone. Inside the *chudong* the drift is reduced and the sediments in the water sink on the ground, so the water becomes clearer. Additionally, the *chudong* functions as a cooling. People exchange the water in variable intervals, which, depending on the season, reaches from daily to once per week. Usually, water is exchanged in the early morning when the canal water is cool and less polluted than during other times of the day. Partly the *chudongs* are used only seasonally, for example in winter, when the pipelines are frozen. Interestingly, other people use their *chudong* in summer only, even if they have a water tap in their surrounding. They regard the *chudong* water to be of better quality than tap water because it is cooler and less turbid.

Most surveyed *chudongs* are situated in the north of Markunja, i.e. Phiaspa, Senkhor, Totserdrong and Daskor. In Table 6.6 all hamlets are listed, in which *chudongs* are used. In many areas, *chudongs* are out of operation, partly for decades and mostly since the installation of public taps.

The results of the household survey account that 17% of the households use water from *chudongs*. In total, 18 functional *chudongs* were surveyed.

Table 6.6 *Chudongs* in Shigar Proper

Hamlet	*Chudongs*	
	number	in operation
Phiaspa	5	5
Senkhor	3	3
Tahirpa	1	1
Totserdrong	2	2
Daskor	2	2
Noghopa	1	1
Bloqkhor	1	1
Kyahong	2	0
Lamsa	2	0
Malakhor	1	1
Kothang Bala	2	1
Rangakhor	1	1

Data: Survey by Landschulze & Voss 2008

Figure 6.14 *Chudong* in Phiaspa
Photo: Landschulze, April 2008

Box 6.2 Case study: Phiaspa and Senkhor

In Phiaspa five *chudongs* exist. All of them are in operation. There are only two functioning public water taps, one of them supplying little water only, which is not sufficient to provide water for all households. Therefore most households depend, at least supplementary, on the use of the *chudongs*. Two to four households share one *chudong*. The water is exchanged in varying frequencies, from daily to three days in summer and five times daily to weekly in winter, usually in the early morning when the canal water is not yet polluted by cloth- and dishwashing in other hamlets.[17] The people stated that in winter the water has a bad taste and smells, whereas in summer, there are many insects in the water. There are two *chudongs,* which are used only in winter if the taps do not function. People state that the water is very turbid.

An exception is the cemented *chudong* in Senkhor, which has been restored by the government last year. The old *chudong* at this site has been damaged irreparably, and the inhabitants could not use it anymore. Since the installation of concrete walls, the quality of the water is, according to the users, better than the water from other *chudongs* due to its reduced turbidity.

Since the WSS does not work continuously, a total abandonment of *chudongs* might pose some problems. In case the taps do not work, people still use water from the canals for drinking, which is even more hazardous than the use of *chudongs*, provided the latter are well constructed and maintained, and the water is changed frequently (as it is not always the case). It might be a better solution to keep some *chudongs* in function, i.e. as a sort of substitution or complementation for not, or rather not sufficiently working water taps, than to pursue an area-wide closedown of *chudongs*.

[17] Phiaspa is located in the north of Shigar oasis and at the end of the canal. One chudong in the north of Phiaspa is also connected to a canal that comes from Thugmo.

Abandoning the *chudongs* completely could lead to the loss of knowledge about their proper construction and use; and furthermore, considering the implementation of a centralised WSS, to the creation of new dependencies, e.g. through modern techniques and materials, or through the goodwill of local or national administrations.

6.6.2 Irrigation canals

Water from the canals is used for irrigation, domestic purposes and also for drinking water. This is possible due to the extensive canal network, which results in short walking distances from nearly all houses in every hamlet.

As derived from the interviews with the tap users, 61% of them are still dependent on canal water. In some hamlets[18], it is the only alternative source to water from the taps. Some other hamlets[19] use *nālā*-water, too. Additionally, in Gambakhor the inhabitants use a spring in the riverbed and in Marapi Bala they use water from the Shigar River itself.

As mentioned, the water from the canals is not solely used for drinking, but also for laundry and dish washing, even though the water taps are working. Since almost all water taps are located in or next to the canals, the water used for washing also flows into the canals. Due to this, the water in the canals is particularly polluted in the peripheral hamlets where it contains all the used water from the other hamlets further upstream (chapter 6.7).

Box 6.3 Case study: Birsatpa

Birsatpa is a relatively small hamlet situated between Kyahong and the *nālā.* It is not provided with any public water supply system. Eight years ago a water pipeline was laid, but since seven years it is out of order. The inhabitants of Birsatpa sometimes use the taps in Kyahong, but as already shown, the quantity of water provided by these taps is not even sufficient for the inhabitants of Kyahong itself. Thus, it appears that the inhabitants of Birsatpa are nearly completely dependent on the water from the *nālā* and the Kyahong-Hrkong, despite its high content of bacteria in this area (chapter 6.7.1).

On the opposite bank side of the Shigar River, a new college has been built for Shigar. It is supplied through a separate pipeline, which runs directly through Birsatpa. In 2006, a new hotel in Birsatpa was connected to this line, while a public tap was not installed. The inhabitants from Birsatpa queried said that this is, because it has been stipulated that Birsatpa already has a water pipeline.

6.6.3 Bottled water

Bottled water is an alternative to all other sources of drinking water. As it is the case in the Northern Areas as a whole, Shigar's market is dominated by the company Nestlé, which ousted almost all other brands. At the bazaar, bottles of Nestlé's water 'Pure Life' is available in volumes of 1.5 l and 0.5 l in grocery stores. The prices have increased in the past years and, depending on the shop, are at 30 to 34 Rs for 1.5 l and 15 Rs for 0.5 l. The high price and the free availability of other water sources result in a very low demand within the local population. Bottled water is bought only in exceptional cases, mostly for pregnant or breast-feeding women, and people suffering from diarrhoea, in order to support the recovery process. Most bottles are bought by tourists, especially in the summer season.

[18] Bunpa, Noghopa, Bloqkhor, Gongma Xserdrong, Bichopa, Doghopa, Skang, Mashunpa, Paldepa, Bangra, Blaqchan, Rangakhor

[19] Ghzoapa, Kyahong, Birsatpa

6.7 Water quality

6.7.1 Bacteriological contamination

The most important factor that leads to a high frequency of diarrhoea diseases is the bacteriological contamination of water, more precisely the occurrence and concentration of general coliform bacteria and Escheria coli (E.coli). According to the standards for drinking water – developed by the World Health Organization (WHO) and also by the Value Standards for Drinking Water in Pakistan that were established in 2006 - coliform bacteria and E.coli must not be detectable in a 100 ml sample (WHO 2006; WHO & GoP 2006).

Water has been tested on coliform bacteria at public water taps in the following hamlets: Phiaspa, Senkhor, Bunpa, Daskor, Bloqkhor, Halpapa (2x)[20], Chhinpa, Kyahong, Kinapa, Bangra, Manthunpa, Blaqchan, Gyanpa Rupa, Ghzoapa. Additionaly, water from one *chudong* in Phiaspa has been tested as it is the only source of drinking water, as well as the *nālā*-water at the eastern part before entering the inhabited areas of Shigar Proper. Moreover, one sample from the bottled water has been taken for verification.

Except for the bottled water, all tested water samples did not meet the WHO standards, since in every 100 ml-sample coliform bacteria have been detected. One example is shown in Figure 6.15. The yellow or orange colour indicates that coliform bacteria are present, while the purple colour (Figure 6.16) shows the absence of coliform bacteria.

The bacteriological contamination of the water from the irrigation canals is much higher than from the taps, as shown by measurement results from autumn 2007, carried out on water taps and canals. The results also point out that the pollution increases with the distance to its intake point. To give an example, at the intake point of Kyahong-Hrkong, which is near to Agepa, the contamination with coliform bacteria amounts 56/100ml, at the mid point of the canal at Bishopa it accounts for 1,600/100ml and at its end point 10,800/100ml. The results also show differences in the contaminations at the intake points of different canals according to their specific location. The contamination at the intake point of the Gongyur-Hrkong, which is situated above the inhabited area amounts 28/100ml. Whereas at the intake point of the Bunpi-Hrkong, it amounts 64/100ml, which is indicative of an increasing pollution within the course of the *nālā*. Sub-canals show a higher contamination: E.g. the water at the intake point of the Byasing-Hrkong, which is a sub-canal of the Marapi-Hrkong, is contaminated with 8,200/100ml (unpublished data by MUNAWER, SKARDU 2007). The contamination levels vary seasonally. The peak of contamination is reached during the summer months in both canals and pipelines. In the *chudongs*, the water quality is

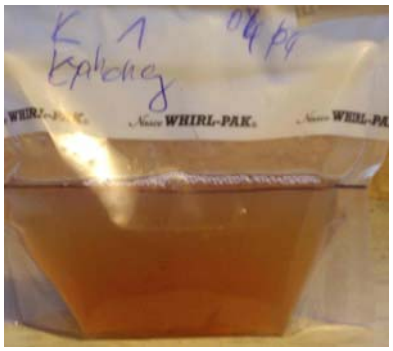


Figure 6.15 Water sample from public tap in Kyahong
Photo: Voss, April 2008

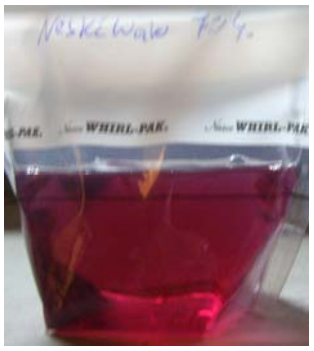


Figure 6.16 Water sample of bottled water
Photo: Voss, April 2008

[20] In Halpapa the water was tested at two taps, one installed from AKCSP and one, which is situated at the main *bazaar*. Both taps are connected to the general WSS.

worst in winter when the water is exchanged less frequently due to water shortage (IUCN 2003:95).

6.7.2 Perceptions of the local people

The local people assess their water very differently, apparently relying on two specific indicators. When being asked for their evaluation of the water quality, people always referred to its turbidity first, and second, to its pollution by insects. If the inhabitants describe their water as 'dirty' they mean that it is turbid or coloured. According to Korput et al., people often do not realise that clean-looking water is not necessarily safe for drinking (KORPUT et. al 1994:29).
The following table shows the results of the interviews regarding the quality of the water at public taps. According to that, nearly four-fifth of the inhabitants have rated the water as 'dusty' and more than half have complained about pollution by insects within the public taps. As to the turbidity, people repeatedly explained that the sand is present in tap water due to the mixture of tap water with *nālā* water and that it occurs particularly strong during summer. In Ghzoapa, some inhabitants stated that they use *nālā*-water[21] and tap water alike as they do not see any difference in the water quality. In some hamlets, people said that in summer, they prefer to use water from *chudongs*, rather than tap water because the *chudong* water is cooler and less turbid.

Table 6.7 Perceptions of the local people concerning the water quality

Water quality	Markunja	Marapi (without WASEP)	Total in %
Clear	3	2	22
Turbid	10	8	78
No insects	4	6	42
Insects	**13**	**1**	**58**

Data: Survey by Landschulze & Voss 2008

6.8 Impacts on public health

Polluted water causes a variety of diseases, among which diarrhoea is the most frequent disease. In addition, hepatitis, cholera and typhoid fever can occur. Health care in Shigar Valley is performed by the Rural Health Centre Shigar, which is a 25-bed hospital, and whose catchment area comprises 50,000 people.[22] There are local differences in the average number of diarrhoea patients. While many patients come from Bunpa, Daskor and Union Council Marapi, there are fewer patients from the areas with WASEP-taps in the south and AKCSP filtered water. In summer the number of cases rises, as people drink more and bacteria proliferate faster, both due to the higher temperatures. Most patients are between five and 15 years old, some of them are affected consistently. The root cause of this situation is not only the bad water quality, but also the insufficient education standards. Therefore,

[21] The people use the water further upstream of the washing place.

[22] In 2007, a total of 34,134 patients were treated in the centre (70-80 patients per day). Between January and March 2008, already 7007 patients were treated.

strong efforts are made by the staff of the Rural Health Centre to educate their patients about hygiene and the health risks associated with the use of canal water for drinking.

If patients cannot afford the necessary medicines, they can get it for free as medicines are supplied by the government and besides, are donated by pharmaceutical companies. Other water-borne diseases like hepatitis cannot be treated in Shigar. Patients then have to go to the hospital in Skardu.

In Shigar Proper, diarrhoea patients can purchase different pharmaceutical products in six medical stores. Eight different products are available, some of them suitable particularly for children. There are three different trademarks, which offer tablets against diarrhoea. The most frequently bought product is Flagyl[23]. The other trademarks are Doxycycline[24] and Naxid[25]. In addition, five different suspensions for rehydration are available[26]. 20 to 50 customers per day buy these products (mainly from June to September).

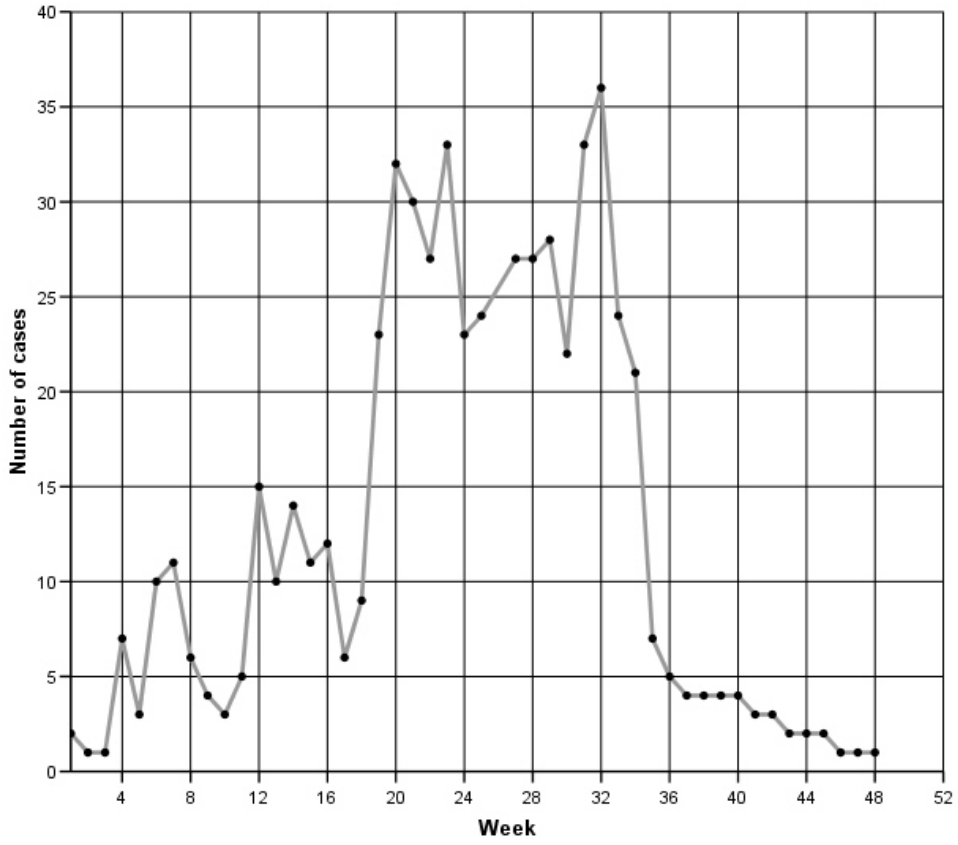


Figure 6.17 Cases of acute watery diarrhoea at Rural Health Centre Shigar in 2007
Data: Rural Health Centre Shigar 2008

6.9 Discussion and conclusions

To assess the adequacy of drinking water supply according to WHO, besides water quality the following criteria need to be considered: Quantity (indirectly prognosticated by the dis-

[23] Sanofi Aventis (Pakistan) LTD., (400mg), 20x10 tablets, 50 Rs for 10 tablets

[24] Swiss Pharmaceuticals (PVT) LTD., (100mg), 10x10 tablets, 20 Rs for 10 tablets

[25] Stanley Pharmaceutics (PVT) LTD., (500mg), 3x10 tablets for 120 Rs

[26] Oral Rehydration Salts from Davisalts (8 Rs), Suspensions Dependal from GlaxoSmithKline, Entamizole from Abbott, Naxid from Stanley Pharmaceuticals and Paldi Care (43 Rs), Entamizole from Abbott, Naxid from Stanley Pharmaceuticals and Paldi Care (43 Rs)

tance to the water source), accessibility (share of people who have access to an 'improved' water source), affordability (consumer tariffs) and continuity of supply.
Table 6.8 shows the different access levels regarding water quantity. According to the ambitious Millennium Development Goals (MDG) the level of basic access should be achieved globally.

Table 6.8 Water service levels according to the WHO

Service level	Assumed quantity of water p/c p/d (in l)	Access measure (distance or total collection time)
No access	Often below 5l	More than 1,000 m or 30 min
Basic access	Average 20l	100-1,000 m or 5-30 min
Intermediate access	Average 50l	One tap on plot within 100 m, under 5 min
Optimal access	Average 100l	Multiple taps on plot with continuous supply

Source: UN 2006:227

According to this scheme, 'basic access' is already provided for the majority of the people in Shigar oasis. For two reasons, however, it is questionable whether this model can be applied on the investigated region this easily: First at all, women, who are responsible for water collecting in this region, usually do not have enough time to get water from greater distances due to their workload (HALVORSON 2003: 124-5). Secondly, spatial mobility of women is limited due to traditional views on women's behaviour in public (see chapter 7 on property rights in Shigar). The criteria of affordability are given due to the fact that both, installation and use of the water taps are free of charge.
Aside from quality, the biggest challenge in drinking water supply in Shigar oasis is continuity, as shown in chapter 6.4.2. The WHO uses the following categories to classify the levels of continuity (WHO 2006: 92/93):

- year-round service from a reliable source with no interruption of flow
- year-round service with frequent (daily or weekly) interruptions
- seasonal service variation resulting from source fluctuation
- compounded frequent and seasonal discontinuity

When applying these categories of the WHO on the collected data, one obviously gains the impression that the vast majority of all 'improved' water sources surveyed in Shigar oasis are assigned to the last two categories. The results presented in chapter 6.4 display the disparities in quality and availability of water from public taps according to the different areas and operators. The main problem rests with the irregular and unreliable availability of water, independent of the number of taps. Even with regard to those public water taps that are running regularly, the situation is aggravated in winter (Figure 6.12 & Figure 6.13). Maintenance of the state-owned taps is not guaranteed due to the lack of funding. Moreover, communication between the inhabitants and the WPD apparently is inadequate (Figure 6.18).

With regard to the water infrastructure of the different hamlets, some considerable disparities were detected. Yet, this does not necessarily imply a decline from the centre to the periphery (Figure 6.10, Figure 6.11, Figure 6.12 & Figure 6.13), but in the first place a decline between the different operators (Table 6.3 & 6.4). The reliability of supply also depends on additional factors, like the diameter of the pipes leading to the respective hamlets, the distance between taps and the main-pipe or the quality of materials used as well as the depth of the pipes in the ground.

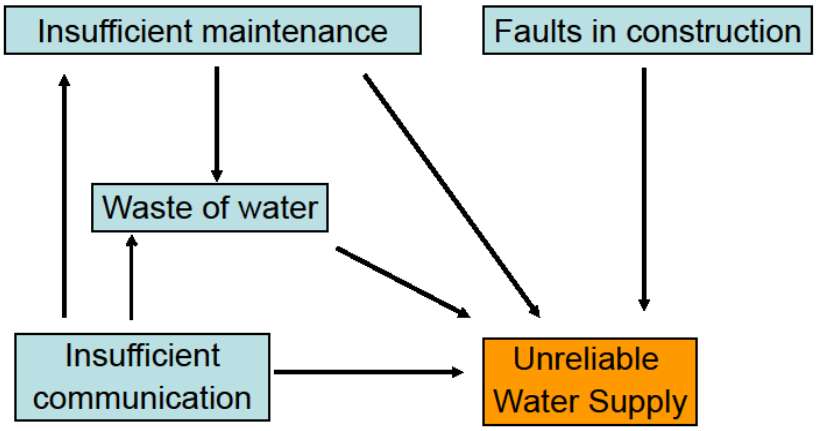


Figure 6.18 Factors leading to unreliable water supply
Design: Landschulze & Voss 2008

Guaranteeing a permanent supply of tap water for all inhabitants, who rely on public drinking water sources, and preventing them from using alternative sources like polluted canals, requires considerable restructuring measures, which need to be implemented on the whole system.

Table 6.9 shows the classification of drinking water sources as it has been established in 2000 by the Joint Monitoring Programme (JMT) of the WHO and UNICEF for the MDGs. With regard to the achievements of the MDGs, people who mainly rely on an 'improved' source[27] are counted as having access to safe drinking water. An ‚improved source' is defined as a source which "is more likely to provide safe drinking water [...] by nature of its construction, which protects the water source from external contamination particularly with faecal matter" (UNESCO 2006:225). One target of the MDG is to provide all people worldwide with access to 'improved' drinking water sources.

Table 6.9 Classification of 'improved' and 'unimproved' ' drinking water sources

Improved sources of drinking water	**Unimproved sources of drinking water**
Piped water into dwelling, yard or plot	Unprotected dug well
Public tap / standpipe	Unprotected spring
Tubewell / borehole	Cart with small tank/ drum
Protected dug well	Bottled water[28]
Protected spring	Tanker truck water
Rainwater collection	Surface water (river, stream, dam, lake, pond, canal, irrigation canal)

Source: WHO & UNICEF 2006:4

[27] The source must supply water for at least 50% of the time.

[28] Bottled water is considered an improved source only when the household uses water from another improved source for cooking and personal hygiene.

As shown earlier, the majority of people in Shigar officially has access to ‘improved’ water sources (public taps and/ or piped water), however, the water provided by the pipe system is not safe for drinking. One reason is that the tap water comes from ‘unimproved’ sources (unprotected spring and stream) and potentially is already contaminated bacteriologically before it enters the pipe system. Nevertheless, the large-scale quantitative tests that were carried out in 2007 and 2008 on behalf of IUCN clearly show that the quality of the tap water as to the bacteriological contamination still is much better than the water from the irrigation canals and the *nālā*.

The problem of contaminated tap water could be solved by the installation of one or more treatment facilities, which of course involves high capital investments, and also higher maintenance costs. Correspondingly, the free of charge supply of tap water, presumably, could not be maintained. But regarding the supposed positive impact on the health situation in Shigar, and also the reduced expenses for the treatment of water-related diseases for both the people and the administration, this issue should be discussed with the local people. Thereby, one could refer to positive experiences made with community-based WWSs of WASEP-projects in Shigar and other regions, as well as other NGOs like AKCSP.

7. Property rights in Shigar: a gender-related survey

Nadine Guenther, Tine Maikowski

7.1 Research interest

We had tongues but could not speak.
We had feet but could not walk.
Now that we have the land
we have the strength to speak and walk![29]

"Land has been and continues to be the most significant form of property in rural South Asia" (AGARWAL 1994:XV) and hence is the single most important source of security against poverty in rural Pakistan, where more than 60% of the total population live (cf. GoP MINISTRY OF FINANCE 2008). "Education, health and non-farm assets will improve well-being and welfare, but giving land to women would mean giving power!" (SDPI 2006:1) International organisations, e.g. the Sustainable Development Policy Institute (SDPI) and the International Centre for Research on Women (ICRW) state that unequal command over property is the most severe form of inequality between men and women today. Furthermore, the SDPI and AGARWAL argue that land defines both social status and political power in the village, and it structures relationships both within and outside the household (cf. ICRW 2007:1; AGARWAL 1994:2). "Independent ownership of [...] resources, especially land, can thus be of crucial importance in promoting the well-being and empowerment of women" (AGARWAL 1994:XV). The academic and theoretical discourse concerning gender and land rights leached four broad categories and interconnected arguments explaining why women need independent rights in arable land: welfare, efficiency, equality, and empowerment (cf. ibid. 27).[30]
This chapter pursues the aim to examine the distribution of property, the formal concept of property rights and its customary practice within the context of gender-related differences in the Shigar oasis. The question primarily sought to answer is if and to what degree the distribution of property (rights) and the decision-making power is related with gender (roles) because "[...] the issue is not just one of property ownership; it is also that of property control" (ibid.). Furthermore, the survey not only addresses the inequality between women and men, but also inequalities with respect to wealth status, age, level of education and marital status. To get a deeper insight it was necessary to additionally find out which conflicts related to property occur and which solutions exist. Another important aspect concerns women's access to property in terms of mobility. Finally, to broaden the picture of gender-related differences in the society even further, data was collected about the division of labour.

[29] Peasant women in Bihar (east India) when for the first time receiving land in their own names in 1982, cited after AGARWAL 1994:XVI

[30] For further information on the theoretical discourse see AGARWAL 1994, MEHDI 2001, ICRW 2007, SDPI 2003, MUMTAZ 2007, MUMTAZ & NOSHIRWANI 2006, et al.

Box 7.1 Indicators of gender inequality in Pakistan

	Female	Male
Literacy	36%	63%
Enrolment in primary education	59%	77%
Enrolment in secondary education	18%	24%
Labour force participation	34%	86%
Legislators, senior officials/managers	2%	98%
Women in parliament	21%	79%
Women in ministerial positions	6%	94%
Income (PPP US$)	977	3,403

Births attended by skilled health staff (as % of total)	23
Contraceptive prevalence, married women (%)	28
Infant mortality rate (per 1,000 live births)	75
Maternal mortality ratio per 100,000 births	500
Adolescent fertility rate (births per 1,000 women aged 15-19)	69

Source: Global Gender Gap Report 2007, Country Profile Pakistan, World Economic Forum, http://www.weforum.org/pdf/gendergap/ggg07_pakistan.pdf

To focus on gender relations and aspects while researching on property rights seemed and also proved to be unavoidable and the only way to obtain a more realistic and balanced view on the actual situation in Shigar. Gender is one important factor in Pakistan (as in most countries of the world) regardless of which sector because till today there are substantial gender disparities (Box 7.1; cf. NYBORG 2002:30).

7.2 Methodology

The research aims to acquire an in-depth understanding of the gender-related distribution of property, power structures and the rationale concerning property (rights) in Shigar.

The research methodology is derived from social sciences. Qualitative research methods such as a semi-structured questionnaire, including also quantitative parameters were applied. It is based on the case study method, which implies an in-depth examination of a single instance.[31] The interviewees were not chosen randomly but specifically. Since the typical case is often not the richest in information, whereas atypical cases may reveal more information, they should be included too.[32] The crucial advantage of this specific kind of qualitative

[31] The distribution of property (rights), subjective perception and argumentation by the interviewees concerning property (rights) and the conditions under which females are able to obtain own property.

[32] Thus, it is appropriate to select certain cases based on their validity (focused sample), rather than using a large random sample. Therefore, the results cannot be generalized; however, the sample

research approach chosen here is that it allows an open and interactive situation thanks to the possibility to react on certain statements and change and redefine the questions during a given interview in order to adopt the questionnaire to the interview situation (cf. CRESWELL 2002:181).

In order to get a deeper insight and to acquire further knowledge of the actual situation in Shigar, and to include hitherto unnoticed aspects, additionally expert interviews were conducted.[33] Their purpose was to detect interesting, pertinent cases[34] and contacts with suitable interviewees.

The sample consists of 20 interviews (case studies) and includes women and men, different age groups, as well as different socio-economic backgrounds.[35] Thus, a diverse picture of the situation in Shigar was captured.

7.3 Findings

The following chapter presents the findings of the survey, regarding the legal and customary practices of property alteration, the ownership of land and other resources, aspects influencing the ownership of property, conflicts, mobility, the power of decision-making, and finally the division of labour.

7.3.1 Legal situation and customary practices

There are different forms of alteration concerning property relevant in Shigar. In general, property changes hands through inheritance, business and also through gift transfers. Compared to Schmidt's results in the late 1990s (cf. SCHMIDT 2004a:170), it seems that the most frequent way of alteration has not changed since then: The sample demonstrates that most of the property (land and house) alternates through inheritance. Additionally, it became clear that animals are often bought, not inherited. This can be explained by the relative short life expectancy of animals.

Regarding the question of inheritance, the majority of interviewees referred to Islamic law, which is officially in force in Shigar since 1963.[36] According to the Islamic law both, sons and daughters, as well as widows, have the right to a defined share. The Holy Qur'an cites that "a son receives as much as two daughters" (Holy Qur'an, Sura 4,7ff). This can be explained by the fact that in Islam and hence also in Pakistan the patrilineal form of inheritance applies. Furthermore, the Holy Qur'an exactly defines all possible forms of family constellations and the specific shares that are entitled for each case (cf. HEINE & HEINE 1993).

---

provides an indication of the actual situation in Shigar concerning gender-related property rights by emphasising local perspectives.

[33] Expert interviews were conducted with the *tehsildar* (land registry office; male), two representatives of the Union Council (female), the Assistant Commissioner (male), a representative of the District Council (female), an employee of the post office (male) and a religious leader (*alim*; male).

[34] Relevant cases are e.g. women registered as land owners in the *jamabandi* or conflict cases.

[35] Relevant cases are e.g. women registered as land owners in the *jamabandi* or conflict cases.

[36] In Baltistan indigenous law (*resm-e-revaj*) documented in the *Codes of Tribal Custom* was in force until 1963 and only sons had the right to inherit property, while daughters and widows were excluded (cf. SCHMIDT 2004a:172). Since then the Gilgit and Baltistan Muslim Personal Law (Shariat) Application Act is applied (cf. LENTZ 2000:400).

"If I take my inheritance,
my brothers will forget they have a sister.
If I give it to them,
they will remember me
and take care of me if I need them"[37]

The interviewees referred nominally to the Islamic law, though *de facto* in many cases the customary law is still applied for the regulation of inheritance: Although daughters are authorised to inherit, they "renounce" their contingent and "voluntarily gift" it to their brothers. A "[...] widespread practice is of forfeiture of the inheritance share by women in favour of their brothers or sons, often through force" (MUMTAZ & NOSHIRWANI 2006:9). This can be explained with the strong social pressure that alienates women by their own family, and even within their family. "The fear of putting kinship relations at stake prevents them from claiming inheritance. In the absence of protective measures, women generally rely on the parental home and brothers in times of need (divorce, illness, economic pressure) and therefore forgo their share in property as insurance for the future" (cf. ibid). Hewitt states that "for a women to seek sanctuary in her father's home is a very useful concept, given that women can not live alone in such societies which are Islamic and subsistence-based" (HEWITT 1991:125). These circumstances clarify the antagonism between Islamic law on the one hand, and the strong orientation to customary law on the other. In Shigar, many women realize their (property) rights primarily through customary law; thus gender inequalities are reinforced. For this reason, the theoretical basis of women's property rights exists but the practical implementation is limited in reality.

Concerning business as another form of alteration of property, it became clear that mainly men are involved in buying and selling property. This fact can be explained on the one hand as a result of women's lack of income, and on the other hand with women's low amount of land property in general.

In the case of gifting property, mostly two cases apply in Shigar: (1) A father gifts land (*hiba*) to one or more sons mostly in order to avoid land fragmentation, or (2) as mentioned above in case sisters abdicate their claim and gift their contingent to their brothers (cf. chapter 7.3.4).

In majority, the interviewees agreed that women are theoretically able to inherit land and animals, even if this never happened before in their own family. This fact highlights the gap between legal rights, customary law and practice. One exception is the inheritance of houses, which was point of discussion and some interviewees were uncertain if females are able to, or would be allowed to inherit a house. This can be explained by the fact that women generally move from their father's house to the new husband's premises, and thus it is important that sons inherit the house to secure the family property. Additionally, some interviewees argued that there is no need for women to inherit or possess a house, because in the event of their marriage, they cannot continue to live there since they "receive" a new house from the husband's family.

[37] A woman in Katni village, Bangladesh, to Hartmann and Boyce (1983), cited after AGARWAL 1994:249.

7.3.2 Ownership of land and other resources

To my brother belong your green fields
O father, while I am banished afar.
Always you said
Your brother and you are the same
O father. But today you betray me…[38]

Besides two exceptions, all households in the sample own land. The amount of land property varies from 2 kanal to 5,000 kanal. Additionally, the majority of interviewees stated to be active in agriculture. However, four cases negated this aspect because they either do not own land or lease it to others and therefore have other income sources than agriculture, i.e. pensions or shops.

In case of animals, the situation is similar. The majority of the households keeps animals, which differ in kind and number between the households. The animal products are mainly used for own consumption, not for processing or generating monetary income. To sum it up: Generally the system of combined mountain agriculture (cf. EHLERS & KREUTZMANN 2000) seems to be still very important and one of the main sources of income in Shigar. This aspect displays that examining the gender aspect of land property is fundamental and important because land still is the most important and most common form of property in Shigar today.

The complete amount of land property of both men and women the interviewees referred to is registered in the settlement records (*jamabandi*). This fact demonstrates that nowadays this form of securing land property and defining land tenure is still important and applied.

With regard to land ownership, out of 20 cases only 5% of the total amount of land is owned by women (Figure 7.1). The vast majority of land is owned by men and registered on their name. Women who own land and are registered in the *jamabandi* particularly are widows.

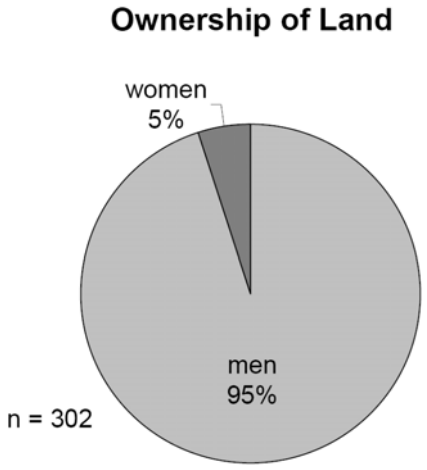


Figure 7.1 Women's contingent of the total amount of land

As the research involved especially cases where females *de facto* owned land, it can be assumed that the general percentage is even lower in Shigar. By searching the *jamabandi* for female names it becomes evident that generally and predominantly men are registered as land owners. Even in such cases where women are registered in the *jamabandi* and formally inherited and possessed land, on enquiry it is actually often used by their brothers or other male relatives. Hence, the women's property right is *de facto* exercised by their kinsman because the women do not claim it. "Theoretically [some] women's names are found in the official record but they usually bargain away their rights. Moreover due to dependency on male kin their actual right may be reduced to the usufruct" (MEHDI 2001:244).Furthermore, 100% of the interviewees stated that the price for land has enormously increased during the last

[38] Folksong sung by Hindu women in Northwest India, cited after AGARWAL 1994:1

years. However, the estimation of a general land shortage in Shigar was strongly dependent on the family's socio-economic status. Economically strong families still have sufficient access to land and therefore do not recognize land shortages. Nevertheless, the potential of the combined mountain agriculture to earn a subsistence-based living decreases and the majority of interviewees reported that their household needs further income sources, i.e. pensions, shops (rental income or own business), labour (e.g. constructors or teachers), and payments from relatives. Significantly, as in the case of land property where men mostly are the owners, also in the case of additional income predominantly men are involved. The vast majority of women is neither active in labour nor generates own monetary income and hence does not possess any own money.

Concerning animals, predominantly men are the legal owners (bought or inherited) even though women are often responsible for taking care of them (an exception is the high pasture). Houses are mostly owned by men, not by women, too, and again, widows are an exception. As already mentioned, people explain this unequal division of property between the genders by the fact that daughters move to their groom's house after marriage.

7.3.3 Aspects influencing the division of property

As already mentioned in the research interest (chapter 7.1), the survey not only addresses the differences between women and men but also inequalities with respect to wealth status, age, level of education and marital status. Primarily it is important to notice that wealth is unequally distributed between the households in Shigar. The monthly income ranges from no income at all up to 60,000 Rs between the interviewees' households, but the majority monthly income ranges between 3,000 and 6,000 Rs per household. The amount of monthly income depends on several factors: The amount of land property, ownership of shops, education level of (male) family members and labour. In addition, also the land property is unequally divided not only between the genders but also between the households: The interviewed households owned between two and 250 kanal land. Few exceptional rich families even own up to 5,000 kanal land.

Concerning the assumption that the share of women's property is also related to certain aspects such as wealth and education status of the household and the age and marital status of the women, the findings display that there is no correlation between women's property and either the education status of the women and the household or the wealth status of the household. Neither educated women nor women from rich and educated households notably own property. Women who posses land or other property are predominantly widows and both neither rich nor very good educated. Therefore the most important factor to women's access to property, overall land, is the marital status. Additionally, men's goodwill also influences women's share of property, as some men gift small parts of their property to women. However, there is no legal right for women to claim these gifts.

The influence of age on women's property is remote. Indeed older women (50 years and older) contrary to younger women own property but these women are invariably widows and the probability to be a widow increases with the advanced age. Young women (married or unmarried; between 15 and 39 years) own no (land) property at all.

The household's wealth status in terms of quantity of land is opposite to women's property. The more land a household owns, the less women are the owners. Widows as the predomi-

nant women owning land posses only between two and six kanal land, whereas the richest men own up to 250 kanal.

However, there are certain factors that influence women's income and own money: In some cases where women reported to have own income and money, they were either educated, widows or came from rich families. Therefore the education and again the marital status as well as the household's wealth status can have a certain influence on women's property, not land or animals but income through labour. However, this only applies to some cases because there are also educated women from rich household who do not generate any income at all.

In Shigar, nowadays an increasing number of women has bank accounts in the post-office. On the one hand these women are widows who need the bank account in order to collect their husband's pension; on the other hand it is necessary for women to receive the annual *Zakat* payments. It becomes clear that women do not hold bank accounts due to wealth or savings but because of poverty and need for monetary income.

Box 7.2 Special case study of widows

- Widows are the only women who hold full decision-making power have access to the *bazaar*

- Widows are more likely than other women to possess own property (land, animals, shops etc.) be registered in the *jamabandi* have a bigger spatial mobility radius

- Additionally, widows have own income work in public (e.g. in a shop)

It becomes obvious that widows contrary to other women have decision-making power, a bigger spatial radius, access to the *bazaar* and do not rely to the strict female gender role (household, children, animals, and field). The narrow defined gender role which generally applies to women disbands and merges into a new role.

Due to this special role widows seem to be more independent than other women. However, this role also bears a lot of challenges and burdens as they are often forced due to poverty, missing support and security (e.g. land) to take over also male duties, e.g. generate income and work in public (shops) to earn a living. Indeed many widows own land but the little amount thanks to customary inheritance practices is not enough for subsistence. Therefore, widows act from necessity and are forced to adopt a new role in-between the traditional male and female role because the traditional female role is not designed without male support.

The prevailing unequal division of property between the genders and women's disadvantage concerning inheritance due to facto applied customary practices is to a lesser extend a problem for married women because they are protected through family and husband. However, in case of widows the small or missing property and inheritance poses a threat. Widow households belong to the most vulnerable households in the society and have special and specific needs which should be thoroughly considered when undertaking development activities.

7.3.4 Conflicts and conflict solutions

"For my father's house I worked hard,
So I should get half of the property.
But father says,
'If I give you land, we will not have enough;

Perhaps I could give you unirrigated land.'
But my brother says,
'No, I will not even give you dry land'".[39]

There are several sources of conflict related to land property, however only the most common forms are mentioned here. One major source of conflict is the gifting of land (*hiba*). This way of alteration mostly occurs inner-familiarly, e.g. when a father gifts land to his son(s) and thus disadvantages the other children (often female) in order to avoid the fragmentation of his land. In this case the disadvantaged children cannot claim their share and may feel cheated on by *hiba*.

Besides the formal and legal ways of inheritance, there are also some local and customary forms: The majority of interviewees reported that in their family women usually inherit less than their due share as secured in the Islamic law. This aspect again is explained by the fact that women move into their husband's household after their marriage. Thus, on the one hand, unlike their brothers who are responsible for their own family, they do not need own property, and on the other hand according to the interviewees women can get a share of their husband's property (also secured in Islamic law). In other cases some men may also be disadvantaged through inheritance-related divisions of land, if the father gives some of his sons a bigger share than others (Box 7.3). Some might not receive a piece of the cake at all. These cases activate conflicts and sometimes the person concerned takes court action.

Besides the inner-familiar conflict due to customary practices, there are more forms of alteration which hold conflict potential: In case of buying new land, there is the risk of a dispute over the amount of land. The buyer argues that more land was sold to him and he paid for a bigger area than he actually received from the seller. In other cases two or more persons claim the same piece of land or house and blame the seller to have sold it twice.

In the Northern Areas different categories of law defining the legal system can be found. They can be differentiated between state (governmental) law (*qanun*) and non-state (non-governmental) law, whereas the non-state law is divided into Islamic Law (*shari'a*), indigenous law (*resm-e-revaj*) and customary law[40] However "the different legal categories are not closed up, but competing and interacting with each other as the individual uses them, this situation is described as dynamic legal pluralism" (LENTZ 2000:436). Attention should be paid to the fact that in Pakistan also the state (governmental) law is based on the Islam and therefore this paper distinguishes between governmental and non-governmental Islamic law (Figure 7.2). The interviewees in Shigar also referred to the indigenous/customary law, Islamic law and the state law in case of conflicts.

[39] A woman in rural Nepal to Enslin 1990, cited after AGARWAL 1994:466.

[40] "State law and Islamic law are defined according to the source of law while indigenous law means the law that had developed before the arrival of the colonial powers. [...] The indigenous law which was included in the legal politics of the *Sikh, Dogra* and *British* and partly written down is called customary law" (LENTZ 2000: 436).

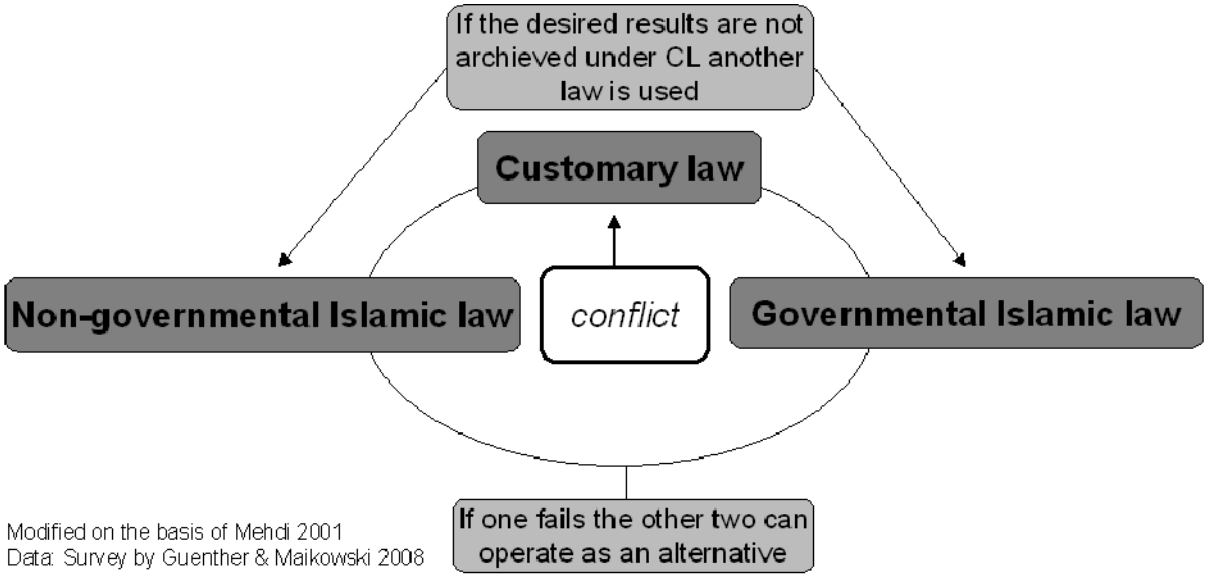


Figure 7.2 Parallel use and interaction of systems of law

There are several different ways to solve a conflict related to property: On the local level there is the possibility to consult the village elder (*tsharma*), who can help through a mediation attempt to find a consensus between the conflict parties. This refers to the indigenous law. The precondition is that both parties accept this way of conflict solving and are willing to find a solution.

Figure 7.3 *Patwari* in Shigar
Photo: Guenther 2008

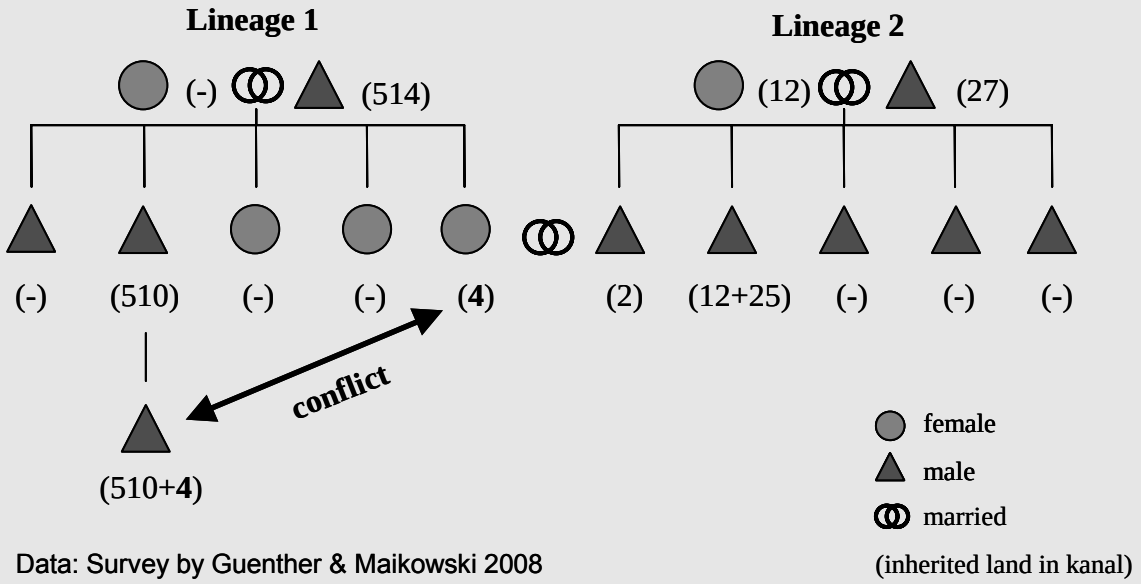
The next higher institutional level is reached through customary law by consulting the *tehsildar* or the *patwari* (Figure 7.3) who can solve the conflict by verifying the mutation and actual status of the property in the *jamabandi* or mutation book (*register inteqalat*). However, this solution does not necessarily have to be accepted by both parties.

If the results are not accepted or the conflict parties prefer a more institutional authority, there is also the possibility to consult the Assistant Commissioner (AC) as a sub divisional magistrate. A judgment on basis of the governmental or state law (Figure 7.2) can be achieved in case both parties appear before court and produce a witness to verify their claim. If one or both parties refuse to accept the final judgment, the case can be transferred to the district court in Skardu.

Another way of solving the conflict is through a religious leader (*alim*), who decides according to the Islamic Law, namely the Holy Qur'an, the Hadith or the Shari'a (see ibid.), and is said to be faster and cheaper than the court. Again, the precondition is that both parties appear in front of the *alim*. However, there is no need to accept the decision of the *alim*, either, although LENTZ states that generally in the Islamic law an amendment is not designated (cf. 2000:196).

Box 7.3 Case study of succession

Saima's* family lives in a kacha house in Niali (Village outside of Shigar Proper). She is a married woman between 40 and 50, living with her husband, one daughter and two grandchildren. Her family is active in agriculture and owns land.



Data: Survey by Guenther & Maikowski 2008

Figure 7.4 Instance of succession

Saima's father owned about 500 kanal barren land and 14 kanal arable land (cf. lineage one). When he died one of her two brothers inherited land (because the other one is handicapped) and Saima herself obtained land (four kanal) as the only one of three sisters. She cultivated this land until her nephew who inherited the land started using it without her allowance about ten years ago after his father's death. Since then Saima has been going to court claiming the four kanal from her nephew, but the court has not decided yet about her case.

Saima's husband grew up with four brothers, but only he and another brother inherited land (cf. lineage two) because the other three brothers are handicapped. While his brother inherited 12 kanal land from his mother and 25 canal from the father, Saima's husband only inherited two canal from his father.

Today, Saima's husband owns 14 kanal in total registered on his name and Saima is still arguing about four kanal used by her nephew. From the 14 kanal only two kanal are inherited land, the other 12 canal were governmental land (noto) and transferred into his property.

In both lineages, the handicapped sons did not get any share, whereas it is unknown, if the medical condition bares the brothers from farming. Furthermore, the unequal division of the heritance between the able-bodied sons and daughters is inapprehensible. One can assume that some family intern disputes may have caused this result. Definitely this distribution is neither conformable with the regular Islamic inheritance law nor with the customary law.

This example of succession shows that the legal Islamic inheritance law is not always applied and that inheritance can be the result of individual decisions, too. As another interviewee stated: "I decide who will inherit my property according to my own wish!"

* The name is changed for anonymity reasons.

To sum it up: there are several forms of law present which can be applied in a pluralistic way. "Customary and formal [Islamic] law are not discrete entities that stand apart from one another, but both are available to individuals" (MEHDI 2001:245).

Women in Shigar generally face more difficulties and obstacles in claiming their property than men. One important point is the low literacy rate of women (Box 7.3). Due to this, for

many women the ability to read the documents is restricted and they feel inferior and uncomfortable. Therefore they are more reluctant to go to a civil court than men. Additionally, women are often not aware of their rights due to their limited education and awareness. According to the traditional understanding, a woman does not go to public institutions such as a court, and if she does so, she needs a chaperon (*mahram*) for companionship. If the *mahram* is the person she accuses or if he refuses to support her, it is nearly impossible for women to go to court anyway. If women are confronted with property-related conflicts, those conflicts occur mostly on the inner-family level. This influences women's difficulties to claim land before a court, because they risk losing not only the case but also the support of the family, while they are bound to alimony.

Another important point which limits women's access to courts is their overall lack of resources: Women often do not have the money to pay for a lawyer, transport to the court, etc. They also depend on quick judgments and cannot dispense with their property[41] because resources are already limited and agricultural land is urgently needed for income. Due to this aspect women often decide to consult the *alim* instead of civil courts and institutions.

7.3.5 Women's mobility

"Women's mobility is yet another barrier that mediates women's access or control over land and resources" (MUMTAZ & NOSHIRWANI 2006:10).

The citation indicates that when talking about property, mobility is an important aspect to be considered. Mobility is essential in order to assure access to property. On the one hand, mobility means access in a spatial manner in order to go to the fields or animals not directly situated near the house, but further away. On the other hand, mobility is important to access new property at all, e.g. in order to buy animals or seeds at the *bazaar*. As a third dimension, mobility also influences the possibility to work (or study as a pre-step) in order to earn money, and thus to have the resources for accessing new property at all.

In Shigar, women's mobility is limited and defined, too. Figure 7.5 illustrates women's mobility radius and the (restricted) mobility areas. The three circles demonstrate three different distances: The own hamlet, the neighbouring hamlets and for the furthest distance Skardu as the district capital with the biggest *bazaar* and higher secondary female schools. The circles are divided into four mobility reasons: fields, *bazaar*, visits and occupation/job. The aim was to find out if and how women have the mobility to access certain places. The specified manners how women can travel are categorized in four groups: (1) alone, (2) in a female group (two or more women), (3) together with a male company (*mahram*) and (4) restricted access at all. Due to these different groups, it becomes obvious that women's mobility is highly depended on distance and reason to travel. In the case of mobility to the fields, the last circle is spared out because it is assumed that in general, the fields are not further away than the neighbouring hamlets.

[41] The property is administered by a neutral person during the lawsuit, which can take up to several years.

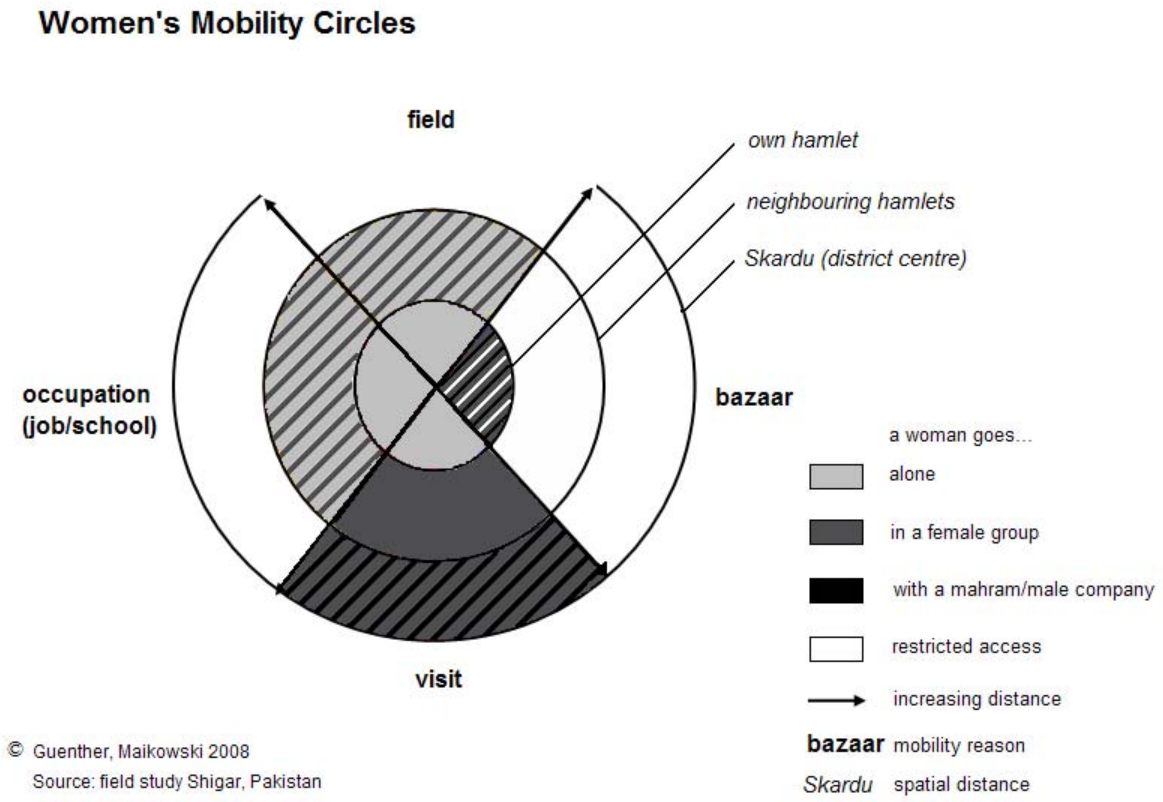


Figure 7.5 Women's mobility circles

SATHAR and KAZI mention three dimensions which may limit women's mobility: "(1) Women need to seek permission to go to certain places; (2) restrictions on going alone to various places and (3) the need to observe *purdah*" (ibid.1997:43).

In Shigar, women generally have no restrictions in accessing the fields alone, if the fields are located next to the house in their own hamlet. Even in the case that the fields are located further away in the neighbouring hamlets, women are allowed to go there either alone or as part of a female group.

The same result applies to the aspect of occupation, namely job or school. In case the work-place or school is located in the own hamlet, women are allowed to go there alone. If the occupation is located in the neighbouring hamlets, they are allowed to go there either alone or as part of a female group. However, if the occupation is located in Skardu or even further away, women are not allowed to go there at all. This privilege is reserved to men.

In the case of visiting family or friends, again, women are free to go alone within their own hamlet. If the visited family lives in a neighbouring hamlet, women can go only as part of a female group, but not alone. Women who want to visit someone in Skardu can do this either as part of a female group, or with a *mahram*.

In the case of access to the *bazaar*, again, women do not have the possibility to go to Skardu at all. Therefore, visits are the only reason why women may travel to Skardu. Concerning access to the *bazaar*, women's mobility is even more limited: Even in their own hamlet women are not allowed to go to the *bazaar* at all. If they are desperate to do so, they either have to go as part of a female group or take a *mahram*[42]. On a further distance, e.g. Skardu

[42] Concerning access to the *bazaar* widows sometimes are an exception.

and even the *bazaar* in the next hamlet women are generally restricted to go. Especially the case of access to the *bazaar* obviously indicates that space is clearly and unequally defined and divided for men and women. Going to the *bazaar*, where probably a high number of men is around (and women can not easily be separated), clearly is a male-only task (Figure 7.5 & Figure 7.6). Concerning the mobility of men, there are no restrictions at all, neither in the manner of travelling nor the reason or the distance. Women's restrictions clearly demonstrate the disadvantages women face in having access to property due to limited education and labour possibilities in Skardu as well as goods/property from the *bazaar* at all.

"The majority of rural and urban women are generally confined to domestic space or activities related to fulfilment of family needs. Interestingly, while permitted to undertake activities outside the homestead like going to fetch water [and work on the fields], they are not expected to take part in any other public activity" (cf. MUMTAZ 2007:150).

Another interesting aspect is the nonetheless existing flexibility of mobility depending on the different reasons to travel: Women are not allowed to go to the *bazaar* next to their house at all but able to access the field in the next hamlets alone without any restrictions. This fact "[...] highlights the contradiction in the rules governing women's movement in the family unit and underscores women's role as a service provider being perceived as acceptable while that with the potential of autonomy as not" (MUMTAZ & NOSHIRWANI 2006:10). If a reason to travel is clearly defined in the female gender role[43], women are allowed to travel further and with less company. One female interviewee described this aspect as follows: "Females [unlike men] need reasons to go outside, e.g. work to do".
The gender-differentiated spatial appropriation of the *bazaar* area in Shigar is another important observation in regard to women's mobility and points out the unequal appropriation of space by women and men. As already mentioned the *bazaar* generally is a male dominated space, whereas female enter only very sparsely. GRATZ entitles in her research two approved ways of transition and utilisation of male-associate space by women in Gilgit: First the transition or utilisation at uncommon time of day, and second the transition by motorised means of transport (ibid. 2006:640). Figure 7.6 displays routes female and male usually take when crossing the *bazaar* area in Shigar. In contrast to GRATZ'S findings in Gilgit, in Shigar the observed way of female exposure to the *bazaar* - as an example for male-associate space - is mainly the bypassing or the avoidance at all. Hence, Figure 7.6 shows on the one hand that female generally avoid crossing the *bazaar* by bypassing the main roads and preferentially use trails. On the other hand, it also displays that men tend to take the main roads and direct ways. They stroll over the *bazaar* to meet friends, while women cross the area quickly and only if necessary.
Furthermore, GRATZ adverts to the different qualities of space. According to her there are sub-spaces in the *bazaar* area which - in contrast to the majority of the circumfluent subspaces – offer more privacy and protection for women (cf. ibid. 2006:656). In general this also applies to Shigar, where lady's shops, which are situated close to the female routes, and

[43] Field work or nowadays occupation in the health sector or as a teacher, which generates income for the family, is convenient with the female gender role.

shops with backdoor entrances and separate salesrooms for women may be an accordant example.

To sum it up: Women's and men's spatial radius of activity and their appropriation of space are apparently highly unequal. Women's mobility is restricted and dependent on the reason to travel, the distance and the companionship. Furthermore, women generally avoid certain public places and roads whereas men are not limited in their decision which route to take and where to go. In addition, the findings display that the situation of women is not homogeneous: There are differences between the women, i.e. widows have less limitations concerning mobility.

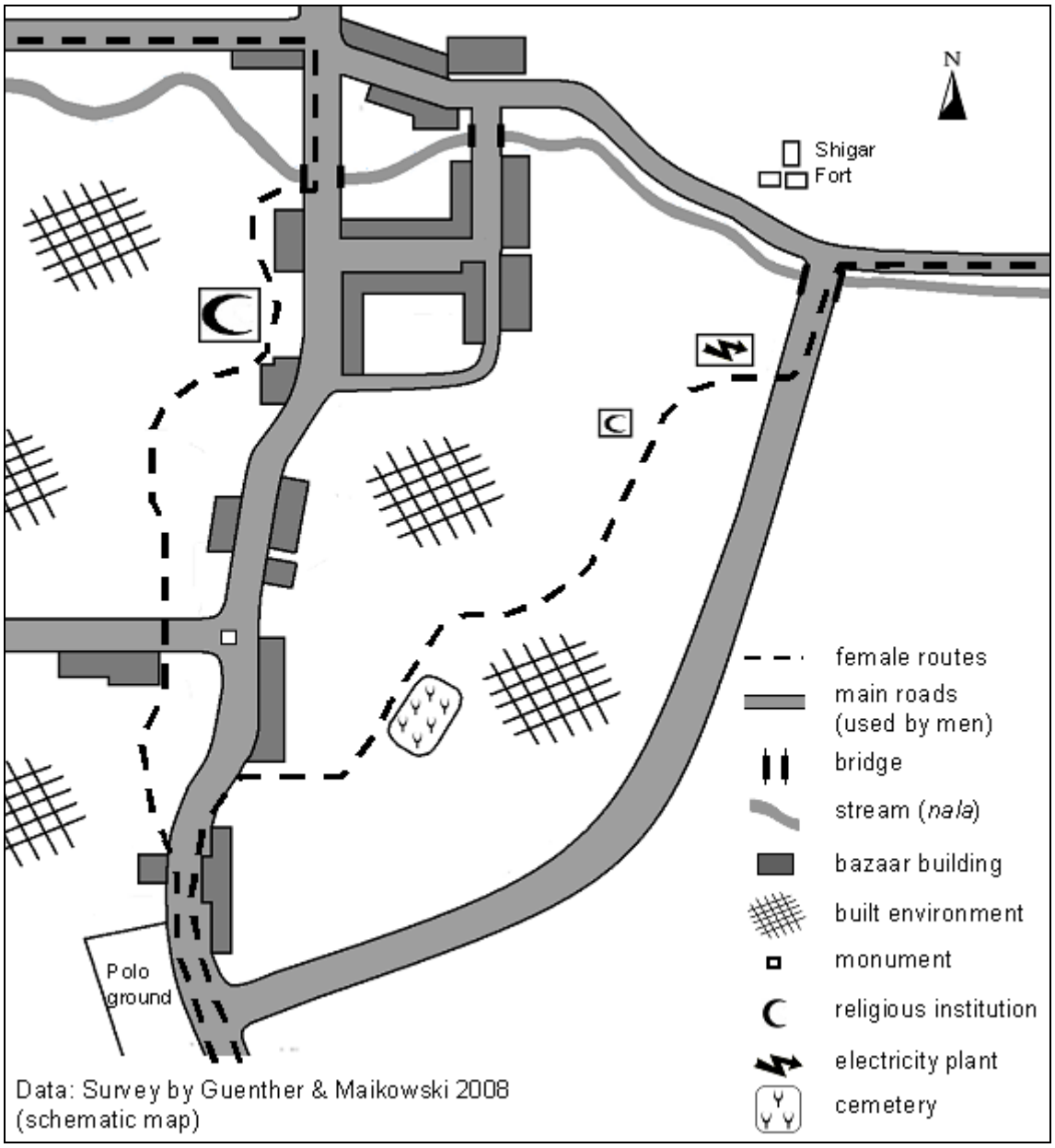


Figure 7.6 Gender-differentiated spatial appropriation of the *bazaar* area in Shigar

7.3.6 The decision-making power

"[...] Gender equality in legal rights to own property does not guarantee gender equality in actual ownership, nor does ownership guarantee control. The distinctions between law and practice and between ownership and control are especially critical in the context gender: For most South Asian women there are significant barriers to realize their legal claims in landed property, as well as to exercising control over any land they do get" (AGARWAL 1994:12).

Generally, the interviewees stated that they try to decide jointly in the household or in the family[44] on all sorts of property, and also on the household expenditures. Women stated that they participate in the decision-making especially in cases concerning the household, children and animals. A female member of the Union Council places emphasis on the men's power of decision-making by saying that "women mostly depend on their husband. A woman has to inform and consult her husband if she wants to buy something. If the husband opposes, she cannot buy it."
On further inquiry the majority of the interviewees reported that concerning decision-making processes, the last word usually is in the hand of men. This can be the father, husband or the son. Hence, the power of decision-making is predominantly in the hand of men. Generally, women and men consult each other, but in case of disagreement, men are the decision makers and the final authority. Overall, there is an imbalance of power in favour of men regarding decision-making structures.
Again widows are an exception; the full decision-making power concerning both public and private aspects is in their hand. In some cases also the eldest son plays an important role and decides with his mother. Widows in contrast to married women also take full responsibility for their household in case no male relative is available they can relay on.

7.3.7 Division of labour

"In Baltistan generally, there is a gendered division of labour[45] [...]. Men and women carry out and perform different economic tasks and responsibilities" (HEWITT 1991:123-4). Also in the specific case of Shigar, Hewitt's general conclusion could be approved. Table 7.1 displays the gendered division of labour in Shigar. Comparing women's and men's tasks, a separation between inside and outside or private and public labour becomes clear (cf. FELMY 1993). "Household chores (cooking and cleaning) and childrearing are the focus of women's activities" (RAJU 1991, cited after AHMED-GHOSH 1993:187). Additionally, women are responsible for spinning wool (Figure 7.7) and looking after the animals (Figure 7.8), whereas men are mainly in charge of the outside labour such as shopkeepers (Figure 7.9) or constructors. Though, this spatial division of labour is not totally strict as the women's field work is located outside, too (Figure 7.10). Generally, the interviewees stated that women are traditionally allowed to work on the fields in contact with men and also in public (for monetary income).

[44] *Family* refers to all members, also living outside the household, including married daughters, children in other cities (e.g. for education reasons), whereas *household* only involves the people actually living together in one house and sharing the household's resources.

[45] The term labour is used for both paid and unpaid work. Paid work (not related to the household tasks) is specified as monetary income through labour/employment and is not comparable to the selling of household products such as milk, wool or animals.

It also becomes apparent that the hitherto spatial division of labour is slowly changing and women are getting more involved in labour outside their homes, e.g. as female teachers or nurses. However, the education as well as the health sector is the typical female labour market and therefore the gendered division of labour is still present. If women work outside nowadays, this does not touch upon their household tasks at all. Their amount of work simply increases. This is mainly due to the fact that "a man will not normally do 'women's work' [...]" (HEWITT 1991:124) and hence is not willing to take over any responsibility in the household. "Only women are responsible for household activities and men are not helping. But I think this is not necessarily only female work" (female participant).
Furthermore the division of labour also influences inheritance paradigms as the WORLD BANK states: "[It is] part of a pervasive gender ideology which affects the kind of work women seek and the kind they are considered suitable for. It affects inheritance patterns and, thus, the kind of productive assets available to support self-employment" (ibid. 1989:3, cited after AHMED-GHOSH 1993:182).

Table 7.1 Traditional division of labour in Shigar

field of labour	women's work	men's work	joint tasks
household	household	buying food (*bazaar*)	
field	weeding sowing	irrigation ploughing	harvesting
animals	feeding milking taking care spinning wool	high pasture	
monetary income	teacher lady health worker nurse lady shopkeeper	shopkeeper teacher soldier constructor public administration etc.	

Figure 7.7 Woman spinning wool
Photo: Guenther 2008

Figure 7.8 Domestic animal husbandry (female work)
Photo: Guenther 2008

Figure 7.9 Male shopkeeper
Photo: Guenther 2008

Figure 7.10 Women working at the field (weeding)
Photo: Guenther 2008

7.4 Conclusion

The results presented in chapter 7.3 indicate basic trends concerning gender-related inequalities in the distribution of property (rights), conflict situations, mobility, and the power of decision-making, as well as the division of labour in Shigar. Generally, the findings display that women and men have an unequal scale of possibilities in regard to the access to property (rights) whereas men have more options than women. The socio-cultural defined role of men privileges them to own, secure and decide over property. In contrast, women's mobility in general and their access to property in particular is clearly restricted. MEHDI reasons in her work concerning the four provinces of Pakistan that women's "scope for holding property […] is still more limited than that of men because of […] customs and taboos" (2001:245). This clarifies that the situation in Shigar is generally comparable with other parts of Pakistan. "Women are operating within a gendered environment, that is, an environment where women in their social roles find themselves differently situated from men in terms of claims to property" (ibid. 2001:244). Hence, the category *gender* plays a decisive role in regard to the unequal distribution of property (rights) in Pakistan.

There are several factors and socio-cultural assumptions contributing to the unequal distribution of property (rights) among the genders. One important factor is the legal pluralism: Although the interviewees theoretically refer to the Islamic law, customary law practices and individual decisions prevail and contribute to the unequal distribution of property (rights) based on gender aspects. Dealing with the topic of property (rights) in Shigar also unsheathes another relevant observation: The irritation of many interviewees when asked who exactly in the household is the owner of the land, animals and house. The perception of property seems to be dominated by the household's access to and ownership of property more than the individual ownership. The expression mostly heard from the interviewees was "it's the joint family". Hence, property is generally seen as a joint family belonging which needs to be protected against others. Household members use the property together and practically own it jointly.

Generally, the interviewees' perceptions of the existing gender inequalities are individual and diverse. This can be explained with varied and personal experiences, interests and possibilities of women and men concerning access to resources and power, as well as different internalisation degrees of the socio-cultural values. Although the ownership of property is un-

equally divided between women and men, females do not necessarily always understand this as discrimination. Particularly married women do not understand the unequal division of property inevitably as a disadvantage as they are secured through marriage. Some women even argue that there exists "[...] the right of residence in father's or husband's land [also] for single, widowed, or divorced women and [thus] protection during their lifetime"[46] (MUMTAZ & NOSHIRWANI 2006:6). Thus, in daily life a clear division of holding seems needless in the eyes of most interviewees (both female and male). MUMTAZ and NOSHIRWANI comment in this regard that "these rights [of residence] are extremely important for women but represent only the right to maintenance and fall short of ownership" (ibid. 2006:6). Hence, women are highly dependent on the goodwill and economic possibilities of male kinship, husband and in-laws.

In case a woman decides to realise her right of the defined contingent assured by the Islamic law or is in conflict based on property issues as well as in times of need (e.g. poor in-law family, widowed and without brothers), the inequality becomes relevant. Women generally encounter more difficulties in claiming their share than men, although women and men theoretically have the same possibilities regarding conflict resolution. According to the research findings, predominantly men are registered as the owners of land property in the *jamabandi* and hence, the formal division of holding privileges men in case of conflicts. Thus, women are more likely exposed to the threat of poverty.

Especially widows face severe problems and difficulties in regard to obtain sufficient property for living and therefore have to adopt a new and modified gender role (in-between typical male and female roles). This kind of livelihood strategy is necessary to compensate their low amount of (land) property and to independently earn a living due to missing male support. Despite those efforts, widow households (i.e. households with no or low income and small amount of property) rank in the lowest social position and hence are the most vulnerable group within the society. Particularly in the case of widows it becomes clear that land is among the most important sources of security against poverty in rural Pakistan (cf. GoP MINISTRY OF FINANCE 2008).

According to the research findings, there is a tendency of giving more possibilities to women today. "Formerly, it was not possible for girls to get further education in Shigar" (female UC member). Nowadays there are more female teachers. "In the past, there were only two or three of them" (female interviewee). Correspondingly, the acceptance of women working in formal employment relationships has increased in the society. Better educational facilities[47] and increasing employment opportunities also amplify women's radius of movement and share of property. The same female UC member states that "there is a change in mobility, too. Before, women could not go out of their homes but now they can even go to other hamlets". With regard to property (rights), she states: "Nowadays some women own property!" These comments underscore the IUCN report findings in 2007 according to which „slight changes are reported in the study area regarding women's [...] role in households, village level decision-making and access to and control over resources, mainly land" (ibid. 2007:19).

At the same time the increasing number of women involved in paid labour is also linked to the high population growth rate in the region and the further fragmentation of plots through

[46] The responsibility of maintenance implicitly devolves upon brothers, if the father is dead (ibid.).

[47] Concerning the increasing educational facilities for women and the number of female teachers see chapter 9.

inheritance. As a consequence, the land size per household decreases, land shortage is noticeable[48] and the households increasingly depend on additional monetary income apart from the combined mountain agriculture system to earn their living.The research work probed what underlies the vast gap between law and its implementation, and identified a number of factors constraining women in exercising their legal claims. Furthermore, the research results agree with AGARWAL, the SDPI and ICRW (as mentioned in chapter 7.1) that command over property is one of the most severe forms of inequality between men and women today and defines both social status and political power in the society as well as relationships within and outside the household (cf. SDPI 2006; AGARWAL 1994:2). The genders' different living conditions and possibilities in general are important to be considered in the planning of future developing activities in the area because projects are likely to have different impacts on women's and men's living spheres. "Securing women's ownership (e.g. housing and land), must be part of any international development agenda" (ICRW 2007:1).

The improvement and development of women's skill is an important factor leading to increased economic autonomy for women, as well as contributes to the household's wealth and living standard. Even though there is no patent remedy to solve these complex challenges, some ideas are nonetheless worth to be considered: Amnesty International recommends preventive and protective measures to promote the human rights situation of women. In order to achieve this it is recommended to undertake public awareness programmes through the media, the education system and public announcements to inform both men and women of women's equal rights under the Convention on the Elimination of All Forms of Discrimination against Women (*CEDAW*)[49]. Furthermore it is useful to provide gender sensitisation training to law enforcement; to ensure that data and statistics are collected in a manner that makes the unequal division of property etc. visible and that human rights activists, lawyers and women's rights groups can pursue their legitimate activities without harassment or fear (cf. DAUER 2001:78). Additionally, it is desirable to promote a public debate about women's rights and roles, especially within a changing society where women will have to take over more responsibility and contribute to the family's livelihood, because "the *process* of acquiring land rights is likely to be as important in empowering women, as the end result" (AGARWAL 1994:XVI).

We hope this research work will provoke that the issue of women's land rights will be given the centrality it justly deserves, because "beyond all, it is the women's fundamental human right – the right to liberty, independence and property!" (ICRW 2007:1).

[48] Concerning the fragmentation of the field area see chapter 7.

[49] The CEDAW was adopted in 1979 by the UN; Pakistan acceded in 1996.

8. Trade and commerce in Shigar

Johannes Höber, Sarah Piel, Julia Steinert

8.1 Subject of enquiry

The following results will provide a focused documentation of the current patterns, strategies and relations of trade and commerce in the *bazaar* economy of Shigar Proper. The term *bazaar* will be used corresponding to DITTMANN, who in his 1994 article proved the regularity of transferring it from the typical oriental *bazaar* for which it once became introduced (DITTMANN 1994:325).

Dealing with the high mountain oasis of Shigar one has to keep in mind that located at an altitude above 2000m Shigar is indeed a high mountain site, therefore the economic sphere is controlled by "verticality" (KREUTZMANN 2006:50).

To understand the functionality of the market principle and to offer a precise description and characterisation of the methods of economic trade in this high mountain settlement, different aspects relating to the range of branches, products and services are taken into account. Elements influencing a local market sphere could be the effects of distant world market forces, social processes or politico-economic interrelationships (KREUTZMANN 2006:51).

Presuming a certain shift away from subsistence agriculture towards a more market orientated economy the actual status of this process has to be examined (DITTMANN & EHLERS 2004:293). According to DITTMANN & EHLERS, the effects of the world market reached the Northern Areas of Pakistan about 30 years ago (DITTMANN & EHLERS 2004:296). Some 40 years ago STALEY still described agriculture as "the main economic activity" (STALEY 1969:227) although "the growth of an exchange economy" had already been recognizable for the two decades before (STALEY 1969:229).

Nevertheless, in Shigar, "combined mountain agriculture still forms the main economic basis for the valley´s population" (SCHMIDT 2000:122).

Further factors in our assessment are the sufficient or insufficient supply of goods and services, the administrative setup, as well as the organisation of the market and the businesses themselves. These different objectives are merged by one central research query which leads to the problem of finding an appropriate methodology: How can challenges inherent in regional provision and trade relations concerning the functionality and structure of trade and commerce in Shigar Proper be assessed?

With this information we try to point out the challenges the present situation gives rise to, giving thought to possibilities for improvement in organisation and resource management in a region with an ever increasing population (IUCN: 2007).

8.2 Methods

To achieve the aim of attaining a profound picture of trade and commerce realised in the area of Shigar Proper, the following methods are used.

The different branches and products are mapped and visualized in a GIS based map of the *bazaar* area, concerning its current structure of utilisation and supplies, as well as its spatial extension. Furthermore a standardised questionnaire, used on a sample of 30 shopkeepers

and 20 customers, generates a more detailed insight into the current market situation concerning the development of product prices and qualities, as well as the trade routes between Shigar and other central markets. This information is completed by detailed expert interviews with a sample of local shopkeepers and wholesalers from Skardu.
The amount of interviews also allows describing further different aspects relating to the structure of the market system, the working conditions and income, as well as the exposure to administrative regulations.

8.3 Branches and products

8.3.1 Spatial extension of the *bazaar* area

Whether or not market places in the Northern Areas of Pakistan can be described with the term *bazaar* was subject to an article written by DITTMANN who argued that in spite of some aberrations concerning constructional and textural attributes, the accordance with other attributes being set, such as functional and religious ones, prevail (DITTMANN: 1994:325). Therefore the term *bazaar*, originally introduced for oriental market places, should be used.
In the concept of this research the *bazaar* area of Shigar Proper is located along the main road around the eastern parts of the *nālā* and can be classified into 281 units of different utilisations. Business in this case is basically understood as retail and services. As mentioned, this focuses on the range of branches, products and services, including specialised shops, specialised services, like the variety of craft, as well as public services. In this respect the concentration of retail and services characterises the so called *bazaar* area. The total spatial extension reaches about 1.4 kilometres from north to south.
By mapping this defined area we can show a detailed picture of different utilisations (Annex A, Map 8.1). It becomes apparent that the area of the *bazaar* had expanded during the last ten years and a higher accumulation of businesses is noticeable. At the same time the oldest shops in the northern part of the *bazaar* close to the *nālā* witnessed a loss of significance. Many shops in this area are unoccupied or have a much smaller range of items compared to the shops in the southern *bazaar* section. Statements mentioned in the conducted interviews indicate a spatial extension of the *bazaar* area, including a shift of the central market section in southern direction.
At the same time new crafts are established at the northern end of the *bazaar* area. In general it is possible to speak of a low-levelled trend of a market extension and diversification.

8.3.2 Different types of business

At the whole *Bazaar* Area both retail and services are established in almost equal shares and claim about a third of all utilisations, each (Figure 8.1).

The different types of business offer a variety of goods and services distinguished by every-day, periodical or seasonal purchases. However, different times of special needs during the year and the relevance of Skardu as a central market for an amount of products and services have to be taken into account. For the types of business in retail a particular high amount of general stores is noticeable. Two-thirds of all businesses in retail are offering a mixed range of all kinds of groceries, draperies and house wares. Beside this mixed-supply orientation, specialised shops dealing basically with one range of products such as building materials, electronic products or poultry, can be found (Figure 8.2).

Figure 8.1 Proportion of different utilisations of the *bazaar* area in Shigar Proper

Regarding the business in services a more balanced arrangement of utilisations can be observed, although the services of crafts seem to have a particular significance. In fact, the establishment of new carpenter workshops, about one third of the total amount of craft workshops, may be seen as an indicator for a general tendency of differentiation Figure 8.3).

Some further aspects contribute to the recent prosperity of this branch: There is an increasing rate of construction activities and a great demand for skilled workers. Local non-governmental organisations (NGOs) like AKCSP support vocational training programmes to qualify people in crafts. Both wood traders and carpenters refer to the timber business as a booming enterprise and they are expecting a further growth of demand. Consequently, the recently established businesses at the boundaries of the *bazaar* area are those of carpenters.

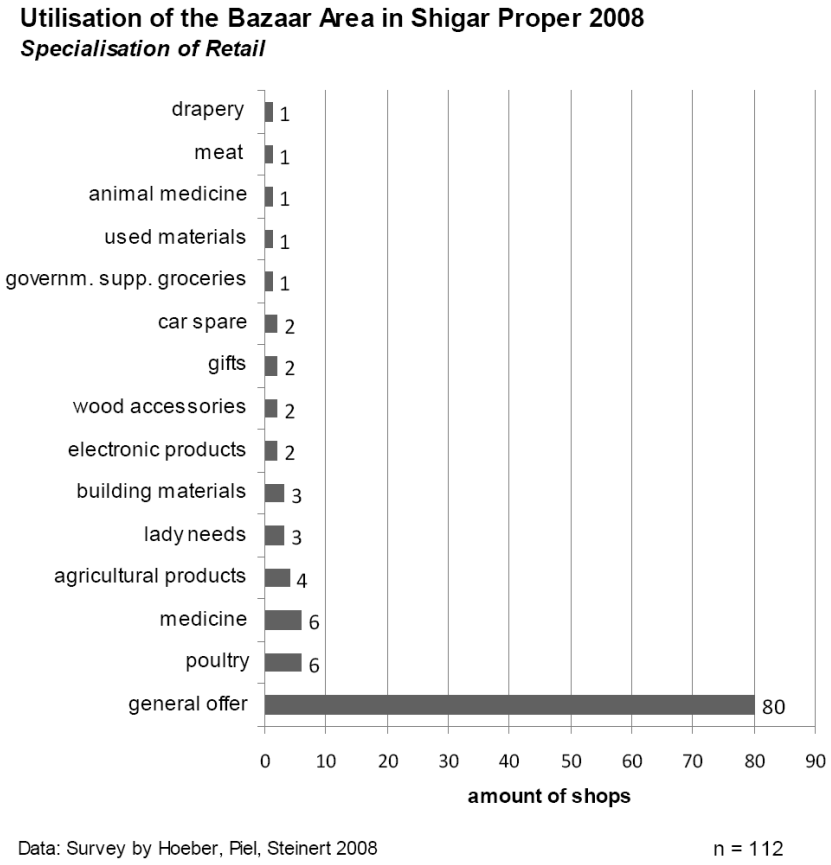


Figure 8.2 Types of specialised retail stores

With a view to the map of utilisation of the *bazaar* area in Shigar Proper 2008, a functional differentiation relating to the spatial accumulation of utilisations in general is not clearly determinable (Annex A, Map 8.1). A further spatial extension of the *bazaar* area might result in a more pronounced special differentiation of businesses, whereas the current *bazaar* structure indicates a mixed functionality.

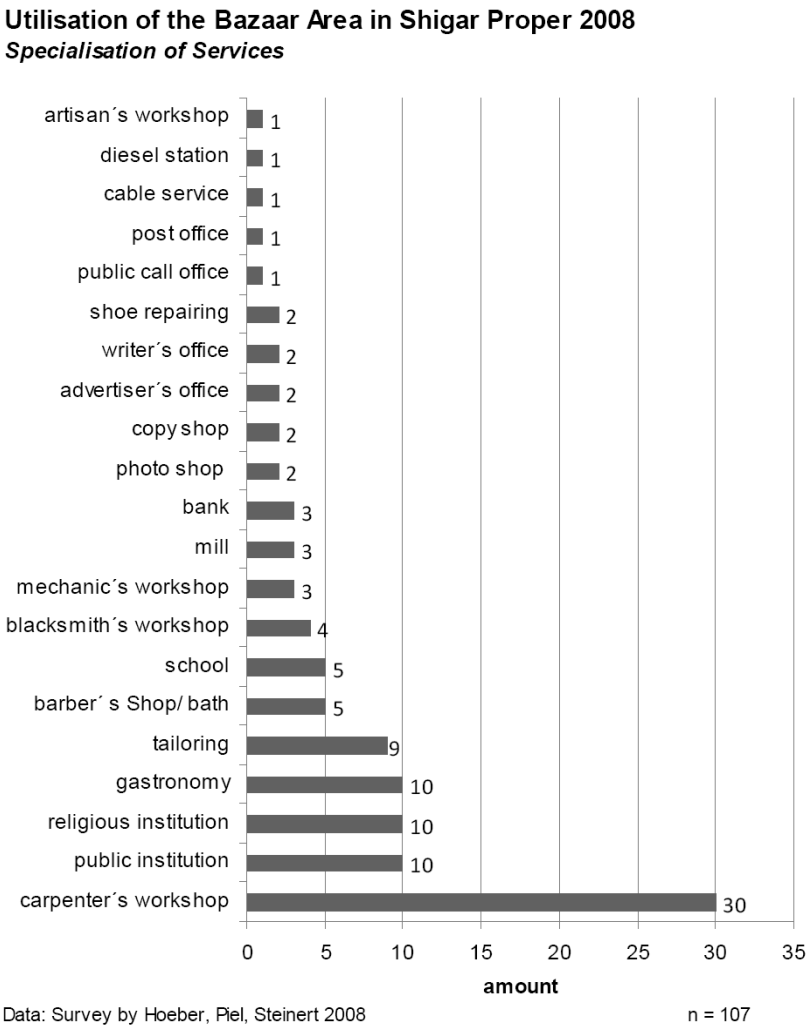


Figure 8.3 Types of services in Shigar *bazaar*

The administration, that means the offices of the commissioner and the assistant commissioner as well as the post office and the schools, concentrate in the peripheral sections of the *bazaar* area, whereas a diversity of businesses can be generally found in the central section. However, in the course of the spatial extension of the *bazaar* area, the latest new shops are also established in peripheral southern sections of the *bazaar* area. The latest craftsmen's establishments, especially the carpenters' workshops, can be found both in the peripheral and the central section of the *bazaar* area, but tend to concentrate in the peripheral section. Other crafts as the tailoring, the black smiths' workshops or the mechanics' workshops are established next to the general stores or other specialised businesses in the central section of the *bazaar* area (Annex A, Map 8.1).

Furthermore, a number of unoccupied shops (about 10% of all units of utilisation) and new shops under construction (nine in absolute numbers at the time of this study) as potential business spaces might encourage a process of change of the *bazaar* economy (Figure 8.4 & Figure 8.5).

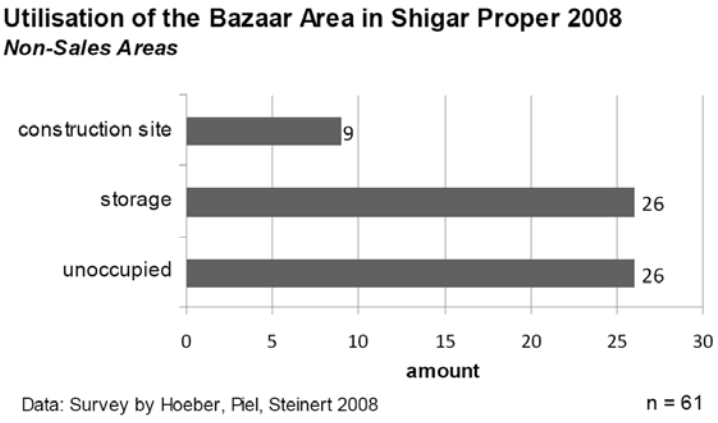


Figure 8.4 Non-sales areas beside businesses of retail and service

Figure 8.5 Construction site of a new hotel in the central section of the *bazaar* area
Photo: Piel 2008

Investing in established businesses or in real estate (mostly new shops) is also perceived as a further source of income. The three investment banks established in the *bazaar* area of Shigar Proper, the HBL Habib Shigar *Bazaar* Branch, the Karakoram Cooperative Bank Limited, as well as the First Microfinance Bank also enable such strategies by financing special business credits.

8.4 Market situation

Figure 8.6 Typical general store with a broad variety of goods offered in the *bazaar* area
Photo: Piel 2008

Absolutely necessary for dealing with the Shigar market and its aspects is to understand the way businesses are set up here. Basic market principles like a certain grade of competition or a close connection between supply and demand seem not to be sufficient indicators for analysing the situation. Despite a very high number of so called general stores (as listed in Figure 8.2), located adjacent to one another and basically offering the same variety of goods (Figure 8.6), an elevated level of competition cannot be examined as the outcome of this situation. Subsequently other indicators are needed to explain which rules induce trade and commerce in Shigar.

The key to understanding is to get away from thinking in simple role allocations of sellers and buyers. Customers do not walk around comparing prices, but simply go and buy what is needed at one and the same shop all the time. Either descendent-related or other close bonds, such as origin of the same village, structure the direction of market access, since the bonds between buyers and sellers, based on trust, guarantee a good deal for everyone. As a result, variations of prices, depending on the customers, can be observed. The better the relation, the better the price, could be a simplified rule. This situation was described for the Northern Areas in general by DITTMANN who also specified religious and ethno-linguistic motives as a characteristic of the *bazaar* economy of Skardu (DITTMANN 1994:333).

One very clear result is that any kind of goods exchange (bartering system) instead of monetary payment is not welcome at any shop being part of the survey. This approach might be modified when certain marketable goods are in season and offered by villagers. This can be

regarded as another indicator for the shift from the former agrarian society towards an extension of the market principle based on monetary income. Being induced on a national level, where the barter agreement between Pakistan and China got aborted with the opening of the Karakorum Highway (KKH), these changes are now also reaching producers in the remote valleys (KREUTZMANN 2004, 2005d; DITTMANN & EHLERS 2004).

However, the possibility of purchasing on credit is given almost everywhere. The local word for credit is *udar*, and it is most common to everybody, sellers as well as customers. Most of the shop owners claim to have outstanding debts in considerable extent. This result is also closing the circle to the question why people use to buy at the same shop, since of course the quality of a personal connection determines the conditions of credit possibilities. The agricultural background of a considerable part of the population leads to a situation, in which seasonal differences with peak times of cash availability during or after harvest times is crucial. Thus, the classification as a society in transition (DITTMANN & EHLERS 2004:293) is justified: Agricultural goods are more and more produced with orientation to the market instead to self-supply, therefore generating income. Still, prices at the local level are not regulated by supply and demand but administrative settings and personal bonds. Also the alteration of agricultural cultivation patterns towards the use of modern farm machines like tractors, as described by DITTMANN & EHLERS, cannot be observed area-wide in Shigar (DITTMANN & EHLERS 2004:293). Furthermore the lack of cash availability is pandering short ways of self-help, for instance granting the possibility to pay at a later date.

Two further conclusions can be drawn: First, financial income from a variety of income sources outside the agrarian sector triggers the growth of the service sector. Still this cannot guarantee a stable cash flow over the year. Second, the introduction of the market principle in many fields of daily life, propagated by global institutions like the World Bank or the International Monetary Fund (IMF), has not yet redeemed the approved system of mutual trust based on personal bonds.

8.5 Annual needs

As pointed out before, the high dependency on agricultural production leads to specified times of needs and times of abundance for the farmers. During the last years the cultivation of cash crops like potatoes, cherries, apricots or apples was forced by external actors such as the banks as one example. High market prices of these products promise high benefits to the farmers as on the other hand they can be left with nothing if prices suddenly decrease. This threat does not keep a considerable number of farmers from planting cash crops which for example leads to a situation of flour deficiency, especially during winter times. In this time of the year the problem gets even more severe due to traffic difficulties which constrict outside deliveries.

Figure 8.7 shows the annual circle of supply regarding these products. It also refers to all agricultural products like grain, vegetable and fruits. On average the respondents are able to subsist on self-sufficient agriculture from February until July and they are less dependent on the offer at the market in this period. In times of shortage people depend on the market, and this is especially true in regard to flour. That also constitutes a seasonally increasing demand especially for grain at the Shigar market.

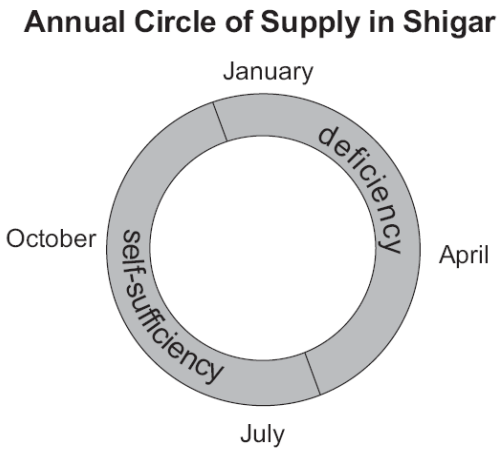


Figure 8.7 Annual circle of supply in Shigar

Even if flour is delivered, there are no fixed prices for it. In winter the prices are increasing, because the demand is much higher. Although there is a government utility shop at the Shigar market, flour is not being sold there for a fixed price. Customers use to go to Skardu to purchase cheaper flour for almost fixed prices. Survey results show that those farmers, who are growing grain, can live on subsistence basis for a much longer period than people who only grow potatoes, vegetables or fruits as cash crops. The average period respondents engaging in subsistence farming can survive on their own products is recorded at about 6.9 months per year, while almost 32% have enough food from their own land for all the year. Interesting in this respect is the seed-potatoes project initiated by the United Nations (UN) – Food and Agricultural Organization (FAO) which triggered the plantation of cash crops as an agricultural way of generating monetary income (ALLAN 1989:138). Prior to this the first governmental survey on production feasibility stated the impossibility of fully self-sufficiency of the Northern Areas and proposed an emphasis on more valuable products (KREUTZMANN 1991:731). Thus, the politico-economic interrelationship becomes pretty obvious (KREUTZMANN 2006:51).

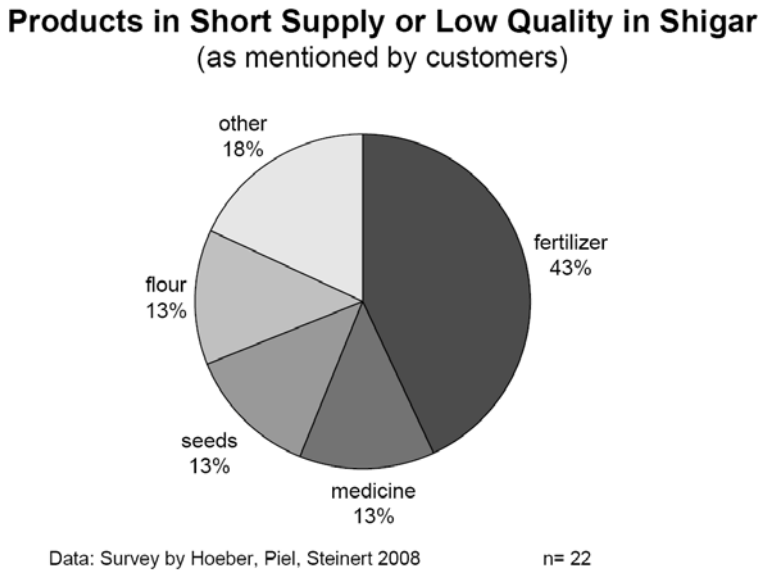


Figure 8.8 Customers' answers when enquired about goods of short supply and sub-standard quality of different products

Products of great demand but in short supply or with a quality less than that available at the Shigar market are fertilizer, specified medicine (e.g. against allergic asthma and different kinds of diarrhoea), seeds and flour. Furthermore toys, cream, cooking oil, books, newspapers and clothes are rare (Figure 8.8). Following some of the customers' remarks, products like meat and medicine are available at the Shigar market, but the quality of these is often low and prices are high. Skardu as the next central market offers a greater variety of prod-

ucts and branches and the prices are often lower. That explains why almost all (97%) of the respondents regularly go to Skardu to purchase different kinds of products, thus inducing a high mobility between Skardu and Shigar.

8.6 Directions of trade

The majority of the products traded in Shigar is coming from Skardu. According to the centrality of Skardu the research shows (in accordance with DITTMANN & EHLERS 2004:292) that it is the most important central market regarding trade, commerce and financial aspects in Baltistan. All products from down country are first delivered to Skardu by wholesalers and then redistributed in and around Shigar. The number of products coming to and from Shigar is shown in Figure 8.9. It is notable that potatoes are being imported as well as exported. The reason for this is that potatoes are ranked among the cash crops, so that wholesalers from Skardu are picking up the goods after harvest and deliver them to the lowland or sell them in Skardu. In this way potatoes are coming back to Shigar and are sold there at the market. By selling their own potatoes to wholesalers people obtain 800-900 Rs per bag of 40 kilos whereas the price at the local market will reach 1,000 Rs later in the year. Indeed, some of the shopkeepers do sell potatoes or other vegetables like spinach and fruits from their own land at the local market. Most important export products for Shigar, even beyond the country's boundaries, are apricots.

Regarding the high numbers of construction work in Shigar the demand of different types of wood is rising. Although people are using local wood from the valley, additional wood must be imported from other regions, predominantly from Gigit District.

Particularly cloth is coming from Rawalpindi. Again the supply of flour plays an important role, since standing on the list of foods it still has to be imported.

Some products such as all kinds of house ware are coming from China. Although respondents either did not know about the actual origin of the products or for some reason did not want to tell, Chinese origin could be observed in many cases, be it for appearance of the product or even stickers witnessing the country of production. In general, great economical importance of a neighbouring country in trade relations seems to be self-evident, but in this case the natural border of some of the mightiest mountain ranges of the world must be kept in mind. It was not until the opening of the KKH in 1978 that beside goods also ideas could be exchanged more rapidly and on a higher level, thus initiating changes in traditional culture or lifestyle (DITTMANN & EHLERS 2004:290). This process did not only bring significant changes in the direct surroundings of the new road but also, with some delay, in the more remote valleys (DITTMANN & EHLERS 2004:292). Baltistan and also Shigar became accessible by an asphalted link road to the KKH bringing "year-long traffic communication and a rapid change of market prices for basic commodities" (KREUTZMANN 2004:202).

Advantages brought by the KKH to the people in the mountain areas included the improvement of general supply (KREUTZMANN 2004:202).[50] The opening of the region to external markets has brought new opportunities for income generation by selling local products to

[50] The most important commodities (measured by merchandise values) imported via the KKH to Baltistan are beef, mutton, poultry products, wheat flour, grain and fresh vegetables (KREUTZMANN 2004:202)

external customers, but at same time implies the exposition to external shocks and risks, interference by external interests and the creation of new dependencies.
The threat of a potential closure of the KKH as the needle eye for supply of the region, by natural hazards as well as human interference for political reasons, shows that the new economic pattern, based on exchange logistics, is vulnerable, not only in times of crisis (KREUTZMANN 2004:204).
Whatever one´s verdict about the changes may be, their existence proves the influence of the KKH in Shigar. And to whatever verdict the view from outside leads it should be kept in mind that the recent research in Shigar confirms earlier studies on a larger scale which found a majority of the local people thinking in favour of this major project of road construction (DITTMANN & EHLERS 2004:296).
In conclusion, Shigar depends on the imports from down country and the KKH improves the trade and the supply of the people in Baltistan.

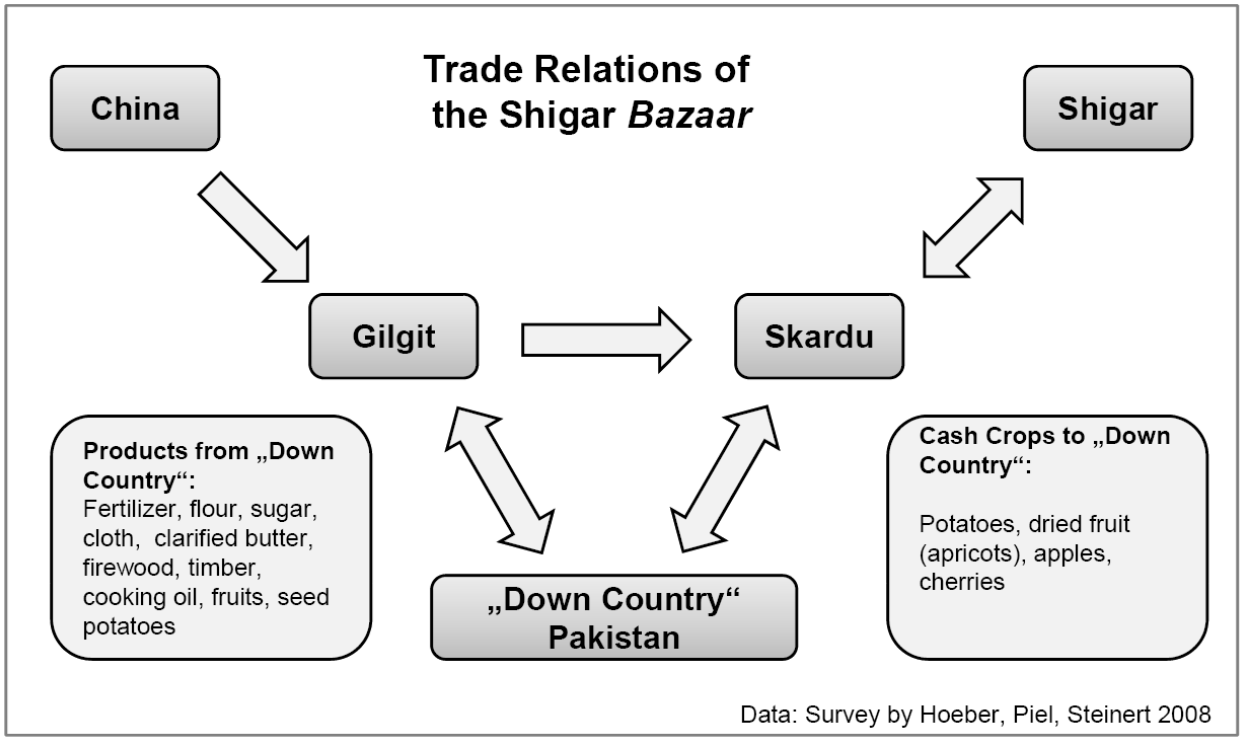


Figure 8.9 Channels of supply to the Shigar *bazaar*

8.7 Development of prices

The standardised survey of the customers shows that all of the respondents mentioned increasing prices. Regarding the survey of shopkeepers, the increasing prices could be explained with the increasing transport costs of the products. Following a number of customers, the price for butter increased from 100 Rs to 120 Rs and the price for cooking oil rose from 58-60 Rs per kilo to 120-130 Rs per kilo within the last year. Products subsidised by the government are available in the Shigar market, of which the most important ones are sugar, butter and cooking oil. This explains why 43.4% of the surveyed customers stated that the price of sugar has not changed for five years. However, 13% claimed a stable price for sodium carbonate although this product is not available at the government supported shop. Grains, especially flour as an essential good are not available in the government shop at all. However, most of the customers use to buy grains during times of shortcoming in Skardu.

The discrepancy between official and unofficial prices or even the way of talking about either the one or the other can lead to confusion for outsiders. Actually there exists an official list displaying fixed prices provided by the municipal government. This list is meant to be followed strictly and violations to it are supposed to be prosecuted directly. In reality, variations of prices are common, as mentioned before.
Another very clear conclusion could be drawn concerning the impact of the level of transport costs on the prices. Almost every respondent mentioned transport costs as to have a main impact on prices, particularly with respect to the considerable increase in prices for basic edibles during the last year.

8.8 Social settings and working conditions

As mentioned, one objective of the survey focuses on the social settings and working conditions of shopkeepers in Shigar.
About one half of the shopkeepers (56%) appraise their household income as sufficient, 27% said their income is not sufficient for living and 10% estimated themselves just at the border between sufficient and not sufficient. Dealing with these figures it has to be kept in mind that for the locals talking about problems, especially with strangers, seems not to be courteous. Sometimes even obvious grievances would not be talked about. None of the informants wanted to make any suggestions for improvements in the market situation relating to the current offer and demand. As pointed out before many households generate income through a variety of different income sources. In this case running a business is also one possibility for employment and generates monetary income in addition to the self-supply strategies of combined mountain agriculture. This also leads to a situation in which some shopkeepers seasonally need to close their shops to go to the high mountain pastures for livestock farming.
According to the education of shopkeepers almost a third of the respondents claimed not to have any formal or professional education whatsoever. Their age ranged between 30 and 60, however the majority was older than 50 years of age and most of these were retired army soldiers. Another 30% finished school at a level lower than 10th class, a good quarter (26.6%) graduated 10th or 11th class. Some 10% finished 12th class and only one got a master's degree. This does not only indicate a low level of education among traders in Shigar but also illustrates a situation in which joining the army offers one of the few perspectives to generate an income aside from agriculture.
Daily working times of shopkeepers range from six to 16 hours workload per day. The average working time reached almost twelve hours per day, but included long periods without any trading activities. A rather social atmosphere with time for having a cup of tea together with other shop keepers and customers can be observed occasionally. Still, time spent at the workplace is reaching high figures, especially calculating with a seven day week, only some hours on Friday afternoons left for leisure.

Figure 8.10 Defiencies of the safety at work in carpenter´s workshops
Photo: Piel 2008

With a view to the working conditions in crafts a deficient safety of work is noticeable. Blacksmiths for instance use to weld without any adequate work wear (e.g. protective goggles). The working places of carpenters show an insufficient power supply to activate the machines thus also increasing the risk of accidents (Figure 8.10).

8.9 Conclusions

The functionality of the *bazaar* economy in the high mountain settlement of Shigar basically can be understood as a supply system where different kinds of needs, which are not substituted by the local strategies of a self-supply principle, are offered and where cash money comes into a circulation system. The cultivation of cash crops like potatoes, apricots, cherries and apples, generates an income source and produces an exchange of goods with central markets and leads to the corresponding characteristic forms of trade.

Relating to the specialisations of businesses it can be stated that general stores dominate the retail. However, a low-levelled trend of specialised businesses of retail can be observed. In the businesses of the services sector an increasing rate of craftsman's establishments argues for a rising demand of skilled workers and leads to presume a new labour market in the construction sector, especially for carpenters. A business, as a source of income, generally offers an employment opportunity and in fact, there still is potential space for new or growing shops.

The range of retail and services basically offers different kinds of goods for the every-day, periodical and seasonal demand. In this respect a further objective of our study was a description of scarcity of products during the year to show the relation between a self-supply principle and the dependencies on the supply by the market. Essential goods like grain have not been sufficiently available or affordable at the time of the survey. Particularly, with regard to increasing price inflation, the question is whether income by cultivating cash crops alone can still fulfil basic needs and if the substitution of subsistence cultivation by cash crop cultivation is still profitable.

9. Formal education in Shigar

Andreas Benz, Susanne Mahrwald, Sabrina Neutz

9.1 Introduction

Pakistan's education system is considered to be one of the least developed through-out South Asia. Following official statistical data of the United Nations Educational, Scientific and Cultural Organization (UNESCO), the national adult literacy rate for the year 2006 is estimated at a level of 54.3%. In contrast, the literacy rate in neighbouring India is estimated at 65.2% and in Sri Lanka even at 90.8% (UNESCO 2006). The literacy rate in the Northern Areas, however, reaches only 38% (GOP MINISTRY OF KASHMIR AFFAIRS AND NORTHERN AREAS 2006:65), although nowadays education plays a significant role in the development of the Northern Areas and is also eagerly demanded by parents.

Despite the low literacy rate in the Northern Areas one has to bear in mind the considerable progress in the field of education during the past decades. Until the 1970s, as the Government under leadership of Zulfiqar Ali Bhutto abandoned the small principalities of the Mirs and Rajas, formal education was almost non-existent in the Northern Areas. In 1981 the average literacy rate was about 15%, whereas 26% of the males but only three per cent of the females were literate (WORLD BANK 1997:2). During the 1990s several projects were launched, aiming at the improvement of educational facilities in the Northern Areas in order to increase the general school enrolment as well as the literacy rate. This development was also facilitated through a rapid establishment of private schools during the past years.

Despite developments and improvements achieved during the past years, the Northern Areas still face several problems in the education sector, such as lack of schools and teachers, long walking distances to schools, poor school infrastructure, cultural and gender-related constraints which especially discriminate against girls, economic deficits and poverty. One of the central problems is the lack of quality education (GOP 2004:10).

9.2 Design and objective of the study

During the past decades quality of education has become a central focus in international discussions on education, particularly since the Education for All Movement (EFA) was launched at the World Conference on Education for All in 1990. Under the leadership of UNESCO the movement set up several goals with the overall objective of reducing illiteracy by the end of the decade. This goal, however, was still not achieved ten years later. In the year 2000 the international community held a meeting in Dakar, Senegal, reaffirming the goals of the EFA movement and defining new goals to be achieved by 2015, eventually recognizing the importance of quality of education. With this new emphasis the international community agreed upon "improving all aspects of the quality of education and ensuring excellence of all so that recognized and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills" (WORLD EDUCATION FORUM 2000:8). Also Pakistan was among the participating states. In the following years Pakistan intensified its emphasis on quality education, particularly on the quality of primary education (cf. GOP

MINISTRY OF EDUCATION 2003b). In this regard, our study focuses on the quality of elementary schools[51] in Shigar and assesses the present situation of these schools.
Nevertheless, the analysis or assessment of quality requires a definition of the term "quality education". Since the concept of "quality education" is depending on relational viewpoints and perceptions, there is a need to develop a set of indicators in order to parameterise the term.[52] The crucial indicator for quality education is the personal and academic qualification of the teacher, since he or she is the central person imparting knowledge to the students. Another important indicator is the availability of teacher trainings or refresher courses, ensuring the professional development of the teacher's qualification and skills. Further indicators are adequate teaching and learning environment, which means the condition of the school building and class rooms, as well as the availability of teaching material such as teacher manuals, student's textbooks, supplementary reading material, maps, posters, and charts. Support from government, community and parents, respectively, is also an indicator reflecting the interest in and also the attention to education. A minor indicator is the school's contribution to students' health, nutrition and motivation. Regarding the nutrition of students it is assumed, however, that the school is not in the position to cater for its students. Other significant indicators for quality education are based on quantitative analysis such as the teacher-student ratio[53] as well as the drop-out[54] and survival-rates[55].
In brief, the following indicators were assessed during the field visit:

- personal and academic qualification of the teachers
- availability of teacher trainings or refresher courses
- adequate teaching and learning environment
- availability of teaching material
- support from government and community/ parents
- school's contribution to students' nutrition and motivation
- teacher-student ratio
- drop-out and survival-rates

9.3 Methodology

During the latest study all 24 schools in Shigar were visited. Beside participatory observations in the schools, standardised interviews with head teachers or teachers were conducted, in order to collect data and information according to the above mentioned indicators.

[51] In this report we use the expression "elementary schools" as a collective term for primary and middle schools.

[52] The list of indicators used in this study does not claim to be comprehensive, and other possible indicators such as learning outcomes, a clear definition of learning objectives, a relevant curriculum, monitoring of school activities by government institutions, content of textbooks, teaching methodology, and reputation of the institution could have been included.

[53] Average number of students per teacher

[54] Rate of students leaving school ("dropping out") during the course of a certain school level

[55] Rate of students persisting on the course of a certain school level

9.4 Results of the field visit

9.4.1 General findings

At present, 24 schools are located in Shigar which comprise primary, middle, and high schools as well as one college. The number and level of all schools are illustrated in Figure 9.1.[56] With regard to the target group for our study, there are 18 elementary schools. More than 50% of all schools are primary schools. With regard to the total number of schools, girls' schools slightly outnumber boys' schools. Thus, the availability of schools for boys and girls is equal and gender balanced. This trend can also be observed at the primary level. Moreover, coeducation at primary, middle and high school level is also available, although separate education still prevails.

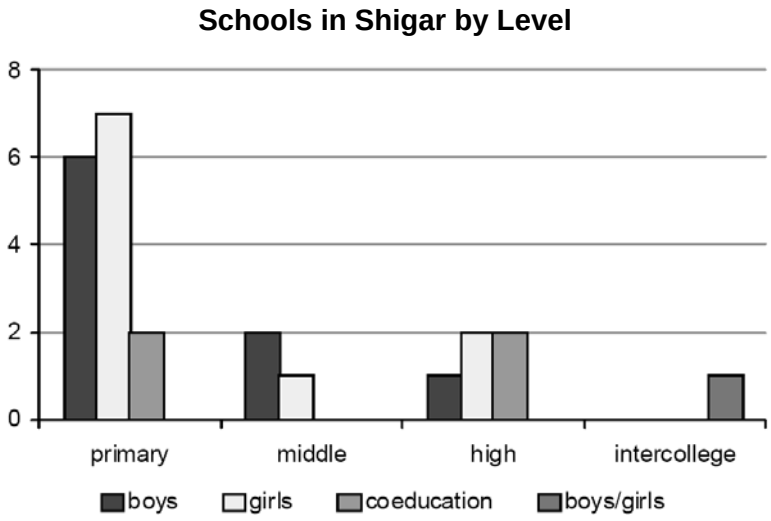


Figure 9.1 Schools by level
Data: Survey by Benz, Mahrwald & Neutz 2008

The existing schools can be classified by type of provider as government, community and private schools, also known as public schools. Government schools constitute the majority of schools in Shigar (Figure 9.2). Nevertheless, it is worth to note that the number of private schools has increased during the recent years, not only in Shigar but also in the Northern Areas and in Pakistan respectively.

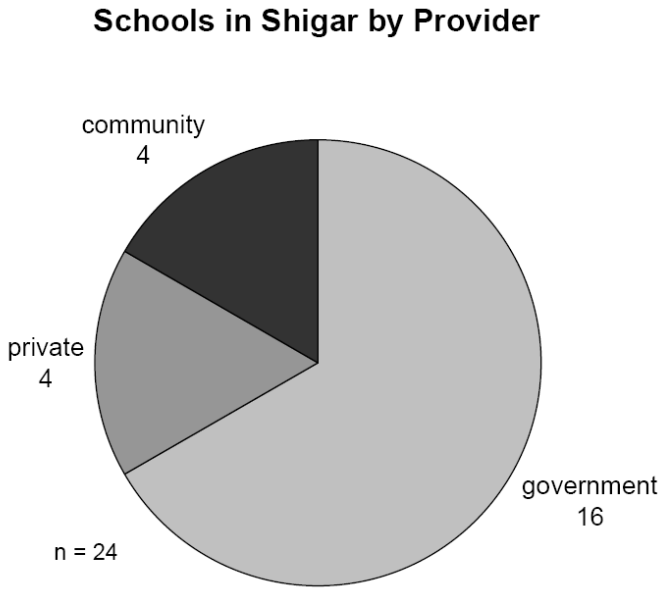


Figure 9.2 Schools by provider
Data: Survey by Benz, Mahrwald & Neutz 2008

All schools in Shigar were established between 1930 and 2008 as shown in Figure 9.3. The first school in Shigar was a boys' primary school, established in 1930. But it was not until 1957 that the first girls' primary school was established. Until the 1990s the number of schools in Shigar increased continuously. During the 1990s, however, Shigar experienced a huge increase in the total number of schools, particularly of government primary schools. This development had several reasons: In 1990 Pakistan,

[56] Schools listed in Figure 9.1 as „high schools" offer high, middle and primary classes (with the exception of the F.G. Boys High School Shigar, which provides only high and middle classes); schools listed as "middle schools" provide middle and primary classes.

among other states, agreed on the World Declaration on Education for All, recognizing that education “must be made more relevant and qualitatively improved, and made universally available” and also that “sound basic education is fundamental to the strengthening of higher levels of education and of scientific and technological literacy and capacity and thus to self-reliant development” (UNESCO1990:2-3).

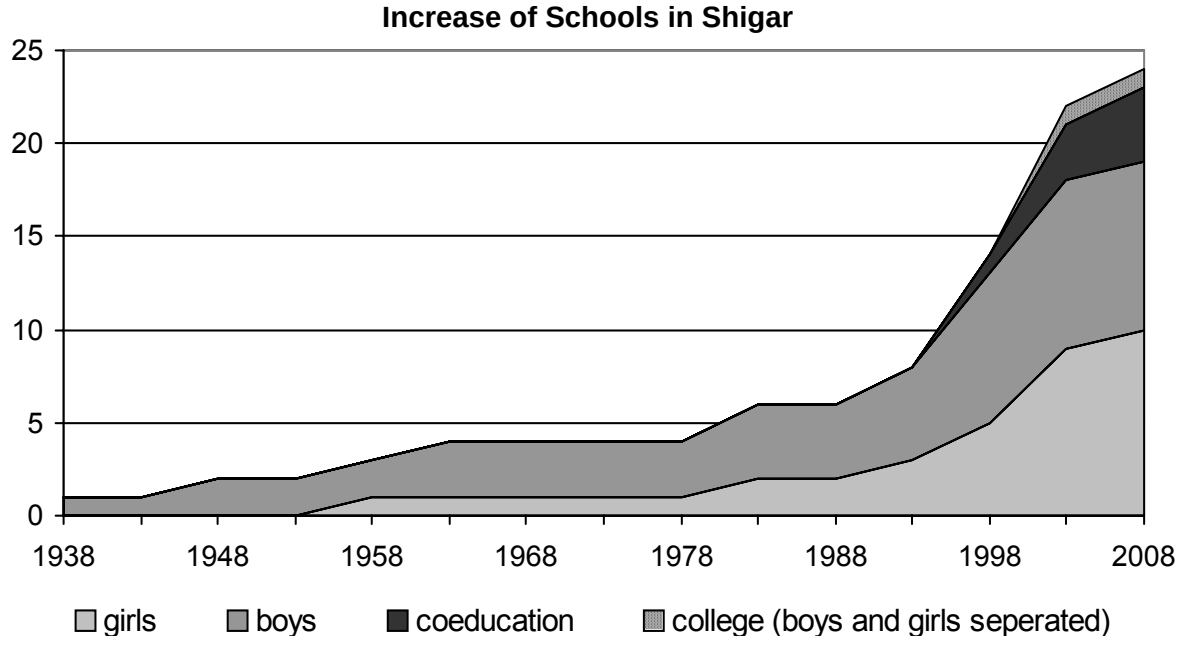


Figure 9.3 Increase of school numbers from 1938 to 2008
Survey by Benz, Mahrwald & Neutz 2008

Thus, increased commitment by the signatory states was demanded. In this respect Pakistan initiated several policy strategies such as the National Education Policy (1992 and 1998-2010), the Education Sector Reform: Action Plan 2001-2005 and the National Plan of Action for Education for All (2003), focussing on the general improvement of educational facilities.
Analysing the distribution of schools in Shigar on the following map (Figure 9.4) it becomes clear, that the establishment of schools since 1930 was mainly focused on the centre of Shigar. In 1980 only five schools existed there, comprising two primary schools, two secondary schools and one high school. It was not until the 1990s when the first primary schools were established also in the periphery of Shigar. Two decades later, in the year 2000, the number of schools, particularly primary schools, has increased significantly, whereas still very few schools are located in the periphery. Furthermore, the number of schools was less gender-balanced before 1990, which means that the number of boys’ schools was higher than the number of girls’ schools. Since then, however, the number of boys’ and girls’ schools got almost balanced indicating equal access to schools for boys and girls.

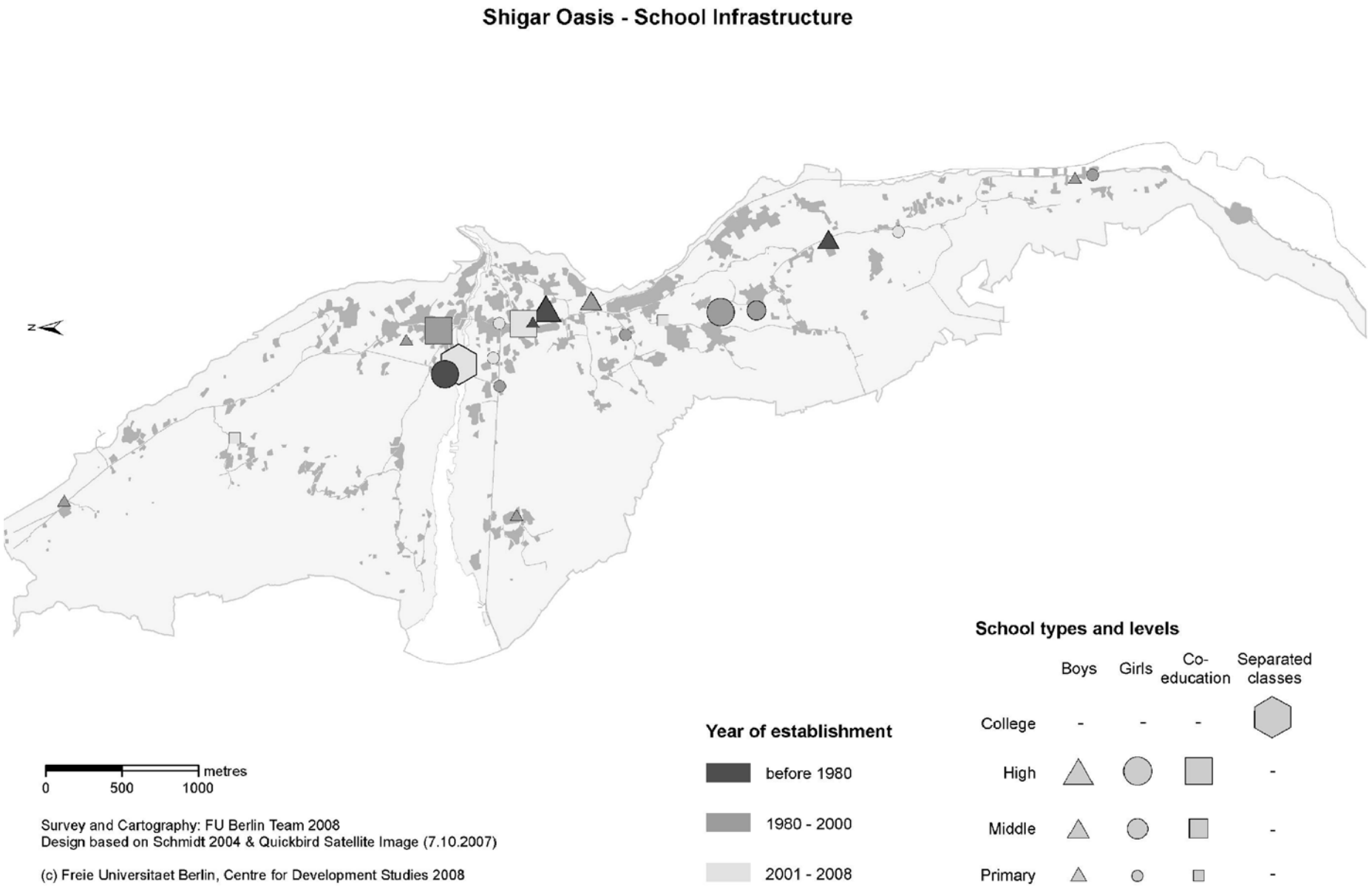


Figure 9.4 School infrastructure in Shigar 2008

According to the present situation the majority of schools is located in the centre of the Shigar oasis. Still, only a few schools are situated in the northern and southern part and to a certain extent in the western part of the oasis. Only primary schools are well distributed throughout Shigar, whereas middle schools, high schools and the college are altogether located in the centre. In consequence, those students who want to continue their education after primary level need to accept long walking distances if they come from the periphery. For example, if a girl student from Thugmo, northern Shigar, intends to go to a middle school for girls, she will have to walk a distance of about four kilometres one way.

In total there are 2933 students enrolled in the schools of Shigar, of which 55% are boys and 45% are girls. The overall ratio of girls and boys enrolled is very balanced, and even slightly more equalized than at the national level (56.5% boys, 43.5% girls, GOP MINISTRY OF EDUCATION 2006:1).

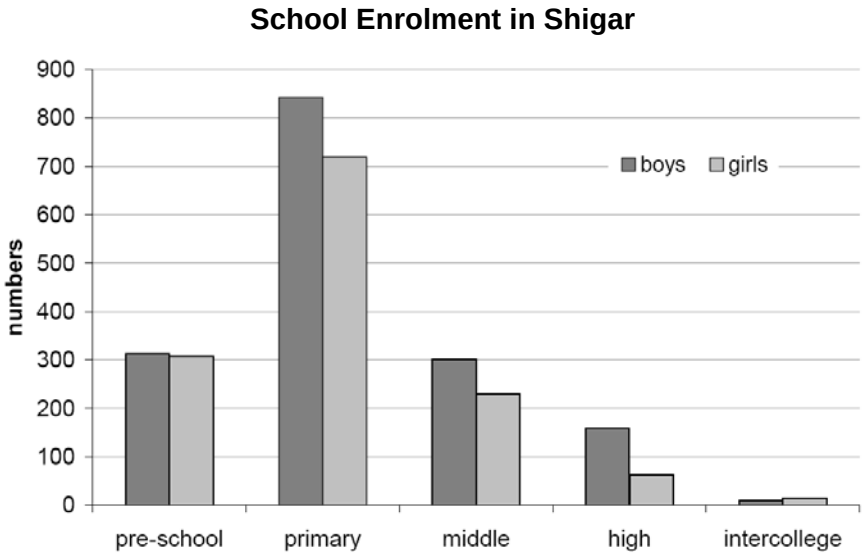


Figure 9.5 Enrolment by gender and school level
Data: Survey by Benz, Mahrwald & Neutz 2008

However, in regard to the data (Figure 9.5), about 74% of the students are enrolled in preschools and primary schools. About 18% of the students are enrolled in middle schools. In consequence, only less than 8% of the students are enrolled in higher education, e.g. high school or college. Due to the longer duration of the primary level (five years) compared to middle (three years) and high school (two years), the absolute enrolment figures in the lower level would be higher even if the enrolment ratio remained constant from primary to high school level. But under consideration of this relation, the figures for Shigar still show that the enrolment rate in the higher levels of education decreases.

In total, 124 teachers work in the schools of Shigar. Unlike the student ratio, the teacher's gender ratio is not balanced. According to the data of the field survey male teachers dominate with 76% while only 24% are female teachers. Despite the fact that the education of boy and girl students in separate schools prevails, the employment of male teachers in girls' schools is quite common. This indicates an acceptance of male teachers in girls' schools throughout society.

9.4.2 Teacher-student ratio

Considering the data on the numbers of students and teachers, the average teacher-student ratio in elementary schools is 1:30, which means that in average one teacher is responsible for 30 students. At first glance, this figure seems to be an adequate ratio, indicating that there are sufficient teachers in the schools.

Evaluating the teacher-student ratio in regard to quality education requires the analysis of the relation between number of teachers and students on the one hand and the number of teachers and classes on the other. Taking this into account, it can be stated that in 15 out of 18 elementary schools at least one teacher is responsible for more than one class at the same time - in other words, teachers face the challenge of multi-grade teaching. Only in two schools one teacher is available for each class. Al-though the quality of learning outcomes of students in affected classes has not been assessed, it might be stated that multi-grade teaching has a negative impact on the learning outcomes as well as on the quality of teaching.

Examining the data in detail, two crucial outcomes attract attention: There is a tendency towards primary schools being more affected by multi-grade teaching than middle schools. Two out of three middle schools and only one primary school have at least one teacher per class. The remaining middle school is also affected, whereas only one teacher, regarding the total number of classes, was lacking. In contrast, in almost all primary schools (14 out of 15) multi-grade teaching is practiced. The second tendency is that the condition in girls' or co-education schools is slightly worse than in boys' schools. The only affected middle school is a girl's school and the only non-affected primary school is a boys' school. At the primary level there are girls' and coeducation schools where teachers are responsible for three to five classes at the same time. This situation cannot be found in boys' schools at all.

This result leads to the conclusion that in almost all elementary schools more teachers are urgently needed, particularly in girls' and coeducation schools. This perception was also shared by teachers or head teachers interviewed in the affected schools. However, not only the number of teachers available in each school is crucial but also their professional qualification.

9.4.3 Qualification of teachers

Within the educational process the importance of teachers as key figures is very high. The most recent National Plan of Action: Education for All recognises that the teacher is considered the most crucial factor in implementing all educational reforms at the grass-root level (GoP 2001:6). The World Declaration on Education for All emphasizes the role of teachers as follows: *"The pre-eminent role of teachers as well as of other educational personnel in providing quality education needs to be recognized and developed to optimize their contribution. This requires to improve their working conditions and status notably in respect to the recruitment, initial and in-service training, remuneration and career development possibilities."* (GoP & UNESCO 2003:14).

According to the data most of the teachers in Shigar Proper have an Intercollege[57] or Bachelor degree as shown in Figure 9.6. More interesting is the fact, that in aver-age male teachers are higher qualified than their female counterparts. These figures show also very clearly the inequality between the two genders. Furthermore, almost all teachers in primary schools hold Intercollege degrees or lower. Only in higher secondary schools, high schools and colleges teachers are higher qualified. Although the government puts high emphasis on primary education, teachers in primary schools are less qualified.

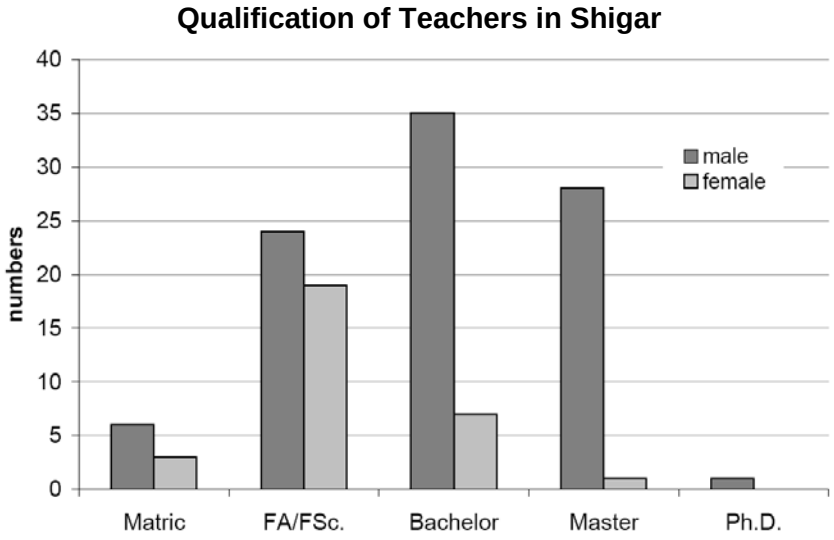


Figure 9.6 Academic qualification of teachers by gender
Data: Survey by Benz, Mahrwald & Neutz 2008

9.4.4 Availability of teacher training and refresher courses

Almost every interviewee got his or her teaching degree several years ago. In the National Plan of Action on Education For All however it is stated that the *"teachers` competence shall be improved and the relevance of training programmes for teachers shall be ensured"* (GOP MINISTRY OF EDUCATION 2003b:6).

According to the data of the field survey, more than 50% of the teachers inter-viewed in Shigar did not have the chance to participate in teacher trainings. They have been teaching for many years without any refresher courses. Those who took part in refresher courses only did this once. Just one teacher got a refresher course organised by the government, all other refresher courses were organised by the Aga Khan Education Service. This is an interesting outcome of the research project. It seems that the government does not provide enough teacher training measures.

Another question was about the necessity of refresher courses on the way of teaching. The outcome of this question was that almost every interviewed teacher would need a refresher course about the techniques of teaching.

Consciousness in the teaching subject is important, but it is equally important to know how to teach. Beside the way of teaching, most of the teachers mentioned a need for courses in almost every subject, especially in science, English and maths. There was even one teacher who mentioned not to have proper knowledge about the new curriculum.

[57] Intercollege (intermediate college) graduation requires two additional years of education after matriculation (class 10); graduation can be obtained either in the arts, commerce and general group (FA, First Examination in Arts) or in the science group (FSc, First Examination in Science)

9.4.5 Availability of teaching material

Ways of teaching are very limited in most schools, since teaching is dependent on the teaching material available in the school. In addition, in those schools, where teaching material is available, it is seldom used. Teachers often do not know how to handle the existing material. The equipment of the schools with different teaching materials, particularly the class rooms, is very diverse. In some schools the walls of the class rooms are painted or draped with maps, posters and charts. In other schools, however, there is either very little or no material available. Often the scarce available material is in a bad shape (in one case even damage by mice has been witnessed (Figure 9.7), or is not applicable to local conditions, because the topics covered have nothing to do with situations of every-day life in a remote high mountain oasis (Figure 9.8).

Most of the teachers themselves noted that they lack teacher manuals, additional reading material, charts, a library, a lab, computer lab models, maps, a globe, blocks for maths or toys and books in their schools. Only two out of 23 schools have a library and only three schools have a laboratory. Therefore in most cases it is up to the teacher how a lesson looks like and to figure out how to teach with new teaching material, since there are no teacher trainings on this issue.

Figure 9.7 Teaching material nibbled by rodents
Photo: Benz 2008

Figure 9.8 Teaching material not suitable for local perceptions
Photo: Benz 2008

Regarding the teaching conditions, teachers were asked why they became a teacher. The answers are quite diverse, as shown in Box 9.1.

Box 9.1 Motivations for becoming a teacher

Mohammad Ali:	"It is my profession. In Islam it is good to be a teacher"
Hussein Ju:	"My father was also an Islamic teacher, so it is my duty to follow him"
Ms. Halda:	"I had no other opportunity but I have also interest in teaching"
Rashid Abbas:	"In those days no teachers were available, so I decided to be-come a teacher"
Ms. Habiba:	"I need to earn money"

9.4.6 Teaching and learning environment

Since students and teachers of all types and level of schools spend a considerable amount of time in the school, the learning environment – i.e. the school building, class rooms, sanitation, as well as the furniture and equipment – should be in a proper condition. In this regard the learning environment is an important factor sup-porting the motivation of students and teachers alike, thus contributing to quality education.

The condition and equipment of schools in Shigar is very heterogeneous. It varies from a proper school building and class rooms equipped with furniture and various types of teaching material to schools in poor condition which possess neither sufficient class rooms, any furniture nor proper teaching material (Figure 9.9 and Figure 9.10).

Figure 9.9 Government Boys' Primary School Senkhor
Photo: Neutz 2008

Figure 9.10 SAP Community Girls' Primary School Rupa
Photo: Neutz 2008

In some schools the buildings and the class rooms are in a poor condition, which means that the walls are damaged and the rooms are dark. In contrast, there are also schools consisting of a proper building and nice class rooms. Only five out of 24 schools have sufficient class rooms for every class. In the remaining 19 schools different classes share one class room or have to sit outside, which is uncomfortable at rainy or cold days with low temperatures.

In almost all schools electricity is not available. Sanitation in general is poor. In some schools sanitation facilities are either in a bad condition, out of order or do not exist at all. Also the quality of furniture and equipment in the schools of Shigar vary significantly. Some schools are provided with sufficient tables and chairs for every student, in others students have to sit on the floor, which is often, particularly in the seasons with low temperatures, cold and uncomfortable.

The learning environment of three elementary schools will be exemplified below in order to point out the different conditions of these schools:

F.G. Boys Primary School Shigar Khas

This government school is located in the centre of Shigar. It is the oldest school, established in 1930, although the present building is of recent times. The overall learning environment is in a proper condition: The school building consists of attractive class rooms (Figure 9.11), although the number of class rooms is not sufficient for all classes. Electricity and also sanitation facilities are available. Furthermore the class rooms are equipped with several teaching materials such as books, maps, models and charts.

A School with Attractive Class Rooms

Figure 9.11 F.G. Boys' Primary School Shigar Khas
Photo: Benz 2008

F.G. Girls Middle School Marapi

This girls' middle school, established in 1980, has a proper school building, whereas the four class rooms available are not sufficient for nine classes and are too dark. However, a new building with more class rooms is under construction (Figure 9.12). Unlike electricity and sanitation facilities, furniture, e.g. chairs and tables for the students, is not available. Beside this, the school has various teaching materials, whereas models are broken, and a library as well as a laboratory for science classes is needed.

A New School Building

Figure 9.12 F.G. Girls' Middle School Marapi
Photo: Benz 2008

SAP Community Girls Primary School Kothang Pain

This school is a former Social Action Programme (SAP) school established in the mid 1990s. It has no proper building. Therefore the students are taught within the schoolyard of the governmental Boys Primary School Lamsa, sitting on the ground (Figure 9.13). Only in winter the students move to their own building, which is actually in an insufficient condition. The class rooms are very dark, the roof is partly broken and there is also no furniture, particularly no chairs. Furthermore the school does not possess any teaching material.

Two Schools Sharing one Schoolyard

Figure 9.13 Government Boys' Primary School Lamsa
Photo: Neutz 2008

9.4.7 The school's contribution to students' nutrition and enhanced motivation

As already mentioned in the introduction it has been assumed that schools are not responsible but also not in a position to cater for their students and in this regard con-tribute to the students' nutrition. This assumption is confirmed through the data of the field survey. Virtually no school visited provides any food or beverages for their students.

Beside the condition of the learning environment, various out-of-school activities on special occasions contribute to the student's motivation. These can be the celebration of national days, teacher's or parent's day, but also different competitions. Out of twelve schools interviewed seven organise various activities on national days such as Pakistan Day or Independence Day. In addition, five schools celebrate a Parent's Day. Activities on such days include reciting the Holy Qur'an, singing songs, reading or presenting poems as well as giving speeches or performing dramas. Some schools also arrange sports days. Only three schools organise competitions in fields like speeches, poems or debates.

9.4.8 Support from government, community and parents

Continuous support of schools by different stakeholders is a necessary task in order to ensure, but also to contribute to quality education. Thereby, support can be pro-vided at different levels as well as by different means.

At the governmental level the support of schools may be characterized through a proper yearly budget, implementation of regular teacher trainings or refresher courses, provision of adequate students' textbooks as well as supplementary reading material and evaluation or monitoring measures. Regarding the budget, the data shows that each government school is provided with a certain fund from the government, depending on the level of the school as well as the number of students. The average annual government school budget is about 20,000 Rs. Two schools even had no budget at all. Almost all Government schools (n=9) interviewed replied that budgets are too low and usually have to be used for repair or maintenance work. In some schools hardly any money is left for furniture, particularly chairs and tables, or teaching materials. Students' textbooks are not available in the schools, and parents have to purchase the books for their children on their own. Supplementary readings for teachers and students such as teacher manuals are only available in some schools. They are lacking either because they are not provided by government institutions or because the budget of the school is too low to buy these items. As already discussed, about 58% of the interviewed teachers do not have the possibility to participate in trainings or refresher courses on a regular basis. This outcome indicates that the support or engagement of the government in this field is very weak, although this measure should be on the agenda of the government education policy.

The community and parents respectively cannot be excluded from daily school activities, since the community and the parents cannot rely on proper support by the Government, yet. Furthermore, if the community or parents are involved or have the chance to take over some responsibilities, they can actively support the school in weak areas through raising additional funds for maintenance or teaching materials but also for organising extracurricular activities. This is particularly necessary for community schools since they do not receive any yearly budget from the Government or other institutions. Two out of three community schools interviewed do not receive any budget. The third community school receives every seventh or eighth month 6,000 to 7,000 Rs which are completely spent for the teacher's salary. Consequently, all community schools do not have any financial means for maintenance, sanitation or additional teaching material.

Most common means of community or parental participation are regular meetings or school management committees, where parents, teachers and head teachers have the possibility to discuss their problems and difficulties and also to find solutions if possible. Particularly in regard to financial shortcomings the community can play an active role in collecting money if needed. According to the data of the survey almost half of the schools are not supported through meetings by the community (Figure 9.14). Four schools conduct at least one meeting per year and two schools conduct at least one meeting per month. In conclusion it can be stated that the support and engagement of the community could be enhanced, in order to compensate weaknesses of the schools.

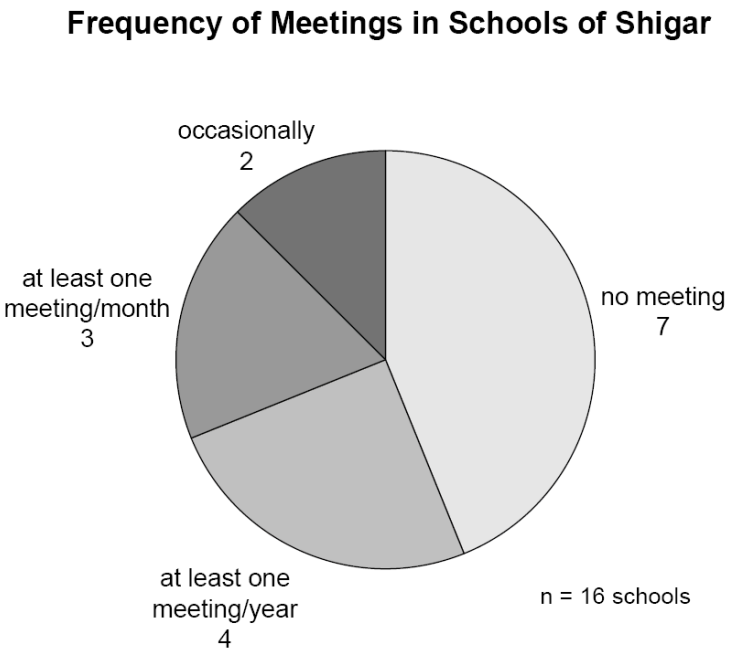


Figure 9.14 Frequency of parent-teacher meetings
Data: Survey by Benz, Mahrwald, Neutz 2008

9.4.9 Drop-out rate and school persistence rate

In the Millennium Development Goals of the United Nations, goal two is not only aiming at increasing the enrolment rates for boys and girls up to comprehensive enrolment at primary level, but also to secure full completion of the course of primary education, in order to prevent early drop-outs. This goal is set as to *"[a]chieve universal primary education [and to] ensure that all boys and girls complete a full course of primary schooling"* (UNITED NATIONS 2007:77).

Pakistan, however, is one of those countries in the world having the highest numbers of out-of-school children, i.e. children in school going age not enrolled. In 2004 about 6.462 million children in school going age in Pakistan were not in school (UNESCO 2007:30). The reasons for children being not enrolled are various. Some are likely to be enrolled late, some never ever enter school at all, and some have initially been enrolled but dropped out before they completed school. The drop-out rate for Pakistan is 30% (28% for females and 32% for males) (UNESCO 2007:35).

Figure 9.15 reflects the situation in the Northern Areas. This is a more alarming situation, because in the Northern Areas the drop-out rate on primary level for boys is 65% and 47% for girls (AKF 2007:4).

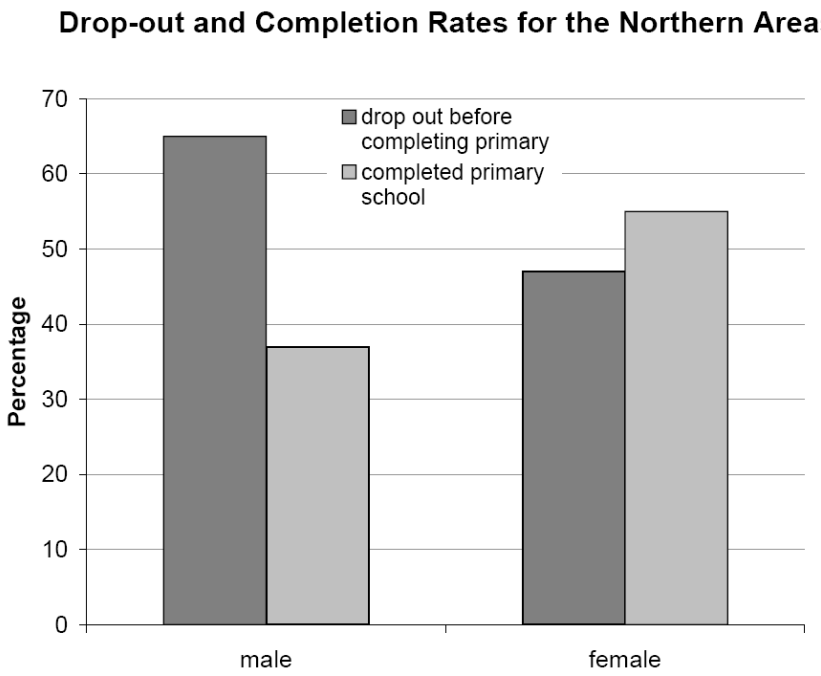


Figure 9.15 Drop-out and completion rates at primary level in the Northern Areas
Data: AKF 2007:4

The enrolment rate of the students in Shigar at the age of 7 to 10 however is very high compared to the national or regional level. Only 7.6% male students and 11.1% female students at the age of 7 to 10 are not in school in Shigar.

The answers we received from the teachers asking for the school survival and drop-out rate for schools in Shigar are quite surprising and contradictory at the same time. For example, the school survival rate mentioned for the F.G. Primary School in Thugmo was 50% but at the same time, the drop-out rate was declared as only 2%, whereas the survival rate for the SAP Community Girls' Primary School Kothang Pain was stated to be 80% but the drop-out rate to be only 10.5%. Therefore, the data should be used carefully, because it is not well pinpointed if these answers given reflect the actual situation.

Over all, out of 22 schools, 14 schools in Shigar have a survival rate which is either over the average or just the same as the average for the Northern Areas. If the survival rate is de facto high, it must be assumed, that there are on the other side very low drop-outs. In Shigar the highest drop-out rate was stated to be 50% (F.G. Intercollege Shigar), which is doubtlessly quite high, but still under the average.

Over all, almost every student who enters primary school does not drop-out before completing primary level. In this respect Shigar is quite outstanding compared to the general situation in the Northern Areas.

Nevertheless, the transition between primary and middle school is a big challenge, especially for female students. However, it is to mention that compared to a couple of years ago, female

students are catching up in education. At least in preschools, primary and middle schools the number of male and female students is quite balanced (Figure 9.5).

9.5 The state of education in Shigar

During the last decades, the state of education in the Northern Areas of Pakistan, as well as in Pakistan in general, underwent a tremendous change and improvement. Starting in 1981 from a literacy rate of 26.2% for Pakistan (FAROOQ 1993:8) and 14.7 % for the Northern Areas (WORLD BANK 1997:2), the rates improved remarkably to present levels of 54.2% for Pakistan (UNESCO UIS 2008) and 39% for the Northern Areas respectively (GOP MINISTRY OF KASHMIR AFFAIRS AND NORTHERN AREAS 2006:69). This is mostly due to a great joint effort of governmental and non-governmental actors to increase the number and improve the quality of educational facilities during this period of time. Better accessibility to formal education made the enrolment rates rising at all educational levels, and the number of graduates increased correspondingly. Alone during the last decade the female primary gross enrolment rate more than doubled in the Northern Areas from 29% in 1994 to 67% in 2005 (AGA KHAN FOUNDATION 2007:3). The former huge gender gap in educational attendance, especially at the higher levels of formal education, is steadily narrowing. Nowadays in the Northern Areas the gross enrolment on High School level is equal between boys and girls, at a rate of about 33% each (AKF 2007:3). Although the gender gap still persists in most regions of the Northern Areas, the overall trends of the three indicators mentioned above – increasing literacy, increasing enrolment at all levels and the narrowing of the gender gap – indicate a fundamental progress in the educational status of the people of the Northern Areas of Pakistan.
This development is accompanied by a tendency to broaden the economic basis of the rural households from combined mountain agriculture to off-farm income generation. Access to off-farm income opportunities, mostly formal employment, is highly dependent on formal education. With the increasing relevance of off-farm incomes for the rural livelihood systems, the awareness of the importance of education for both, male and female, has grown substantially.

9.5.1 Current status of education in Shigar

In the scientific literature and in official statistical reports, there is no consistent definition of the term literacy. In reports of the Government of Pakistan, a person is considered to be literate, if he or she “can read a newspaper and write a simple letter, in any language” (GOP POPULATION CENSUS ORGANIZATION 2001:Annex D) and the ratio is based on all persons aged ten years and older. On the international level, UNESCO is treating as literate all persons who can “read and write, with understanding, a simple statement of their everyday life” (UNESCO 2007:62), with the ratio based on all persons aged 15 and older. IUCN is using a somewhat different and quite restrictive definition of literacy in their report on the Socio-Economic Baseline of Shigar (IUCN 2007). According to this specification a person is considered as literate when he or she at least has graduated middle school, i.e. grade eight, and the ratio is being calculated on the basis of the whole population without age restriction (IUCN 2007:14). This leads to figures which are considerably lower than those of common literacy definitions and makes it difficult to compare them. In this report I will follow a modified version of the definition of literacy used by AKRSP in their reports on Socio-Economic

Trends in the Northern Areas, in which a person is considered literate when he or she has graduated primary school (i.e. grade five), and the ratio is calculated on the basis of all persons aged ten or older (AKRSP 2007:58). My modification will be to consider only persons aged 15 or older and calculate the ratio on this basis, with respect to the fact, that some children older than ten years – due to frequent late enrolment in Shigar – still are attending primary level classes.

The recent adult literacy rate for Shigar is close to 51%, which is only slightly lower than the average for Pakistan (54%, cf. Table 9.1). The same is true when these figures are considered differentiated by gender. The male adult literacy rates are almost on the same level for Shigar and for Pakistan, while the female rate is with 33% somewhat lower in Shigar than the average in Pakistan, which is nearly 40%. Keeping in mind that the average adult literacy rate for the Northern Areas is clearly lower than the Pakistan average, we can conclude, that Shigar – which almost reaches the level of the Pakistan average – represents one of the more advanced regions in terms of formal education, although it does by far not reach the outstanding educational levels of the most advanced regions in the Northern Areas.

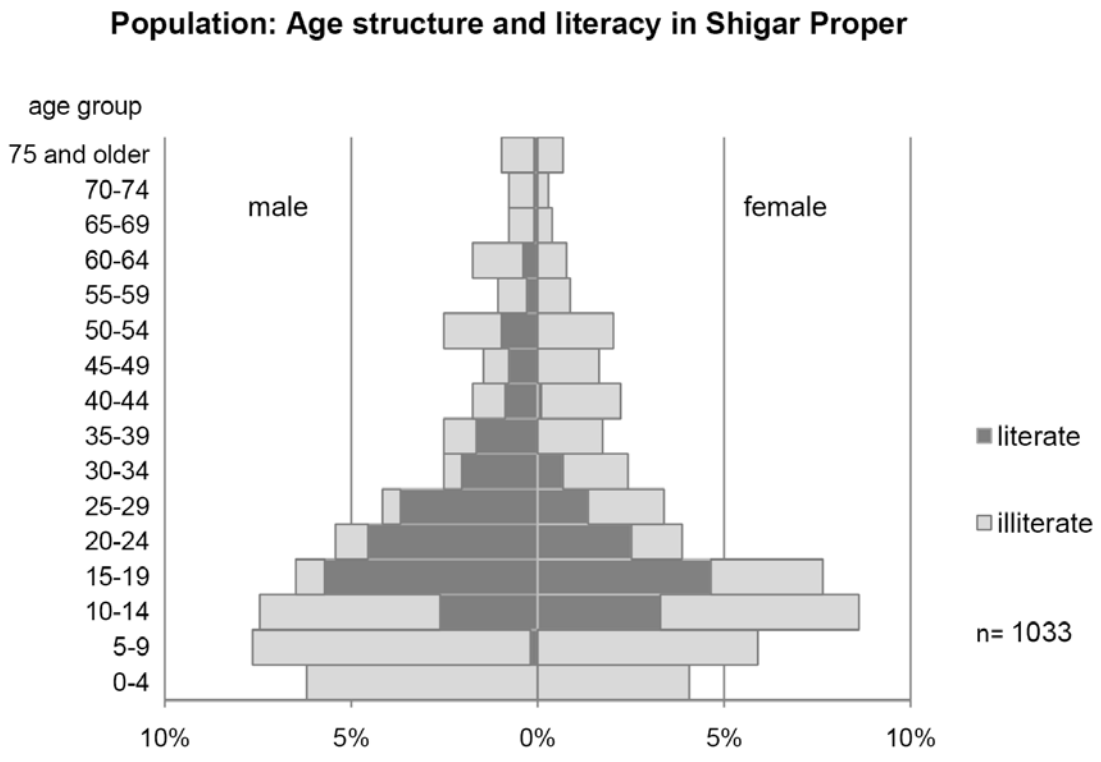
Table 9.1 Literacy rates in Shigar and Pakistan

Literacy	Shigar (2008)	Pakistan (2005/06)
Adult Literacy Rate		
Total	50.7%	54.2%
Male	66.0%	67.7%
Female	33.2%	39.6%
Youth Literacy Rate (15-24 years)		
Total	74.4%	65.5%
Male	86.2%	76.7%
Female	62.2%	53.1%

Data: Survey by FU Berlin Team 2008; UNESCO UIS 2008; UNDP 2006

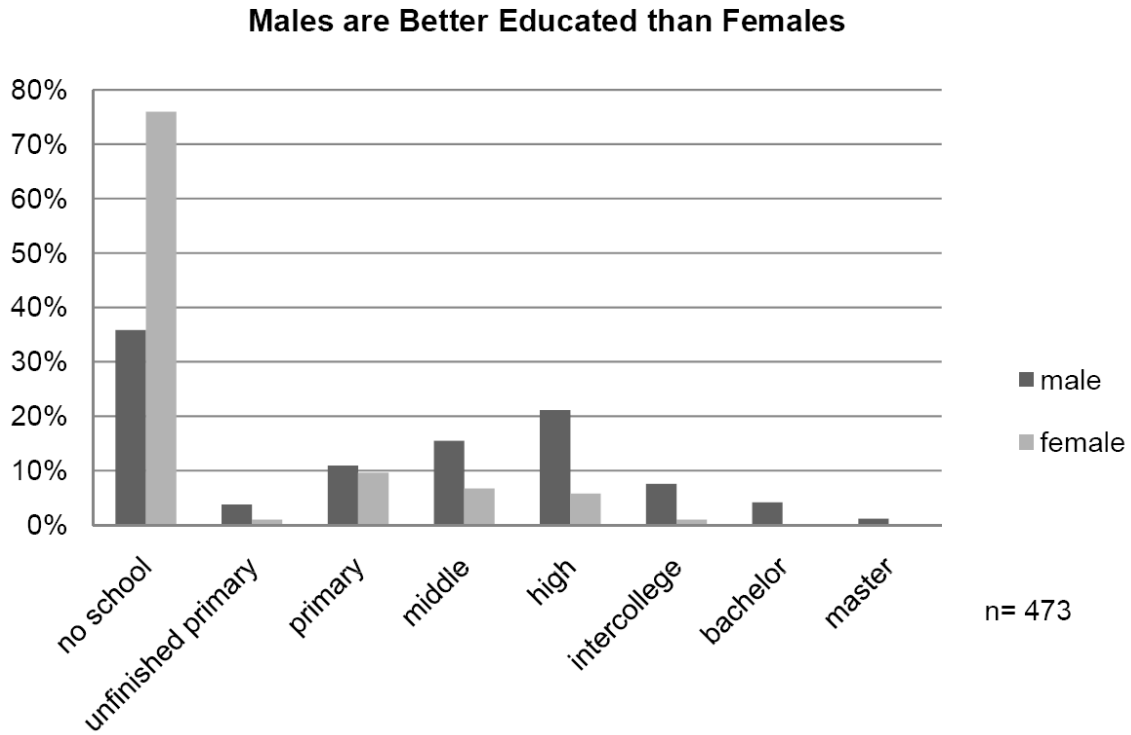
The facts are quite different when considered the youth literacy rate for Shigar and Pakistan. Was it Shigar slightly lacking behind the Pakistan average in adult literacy figures, Shigar shows a nearly 10% lead in youth literacy rates against the average of Pakistan (Table 6.1). Together with the fact, that the youth literacy rates for Shigar are substantially higher than the adult literacy rates in this community, this indicates a fundamental change and dynamics in the field of formal education attendance.

The analysis of the literate and illiterate population by gender and age groups as shown in Figure 9.16 gives a first hint on the character of this dynamics. It becomes obvious, that in the age-group of 35 years and older, nearly any literate woman can be found. Male literates can be found in every post school age group, and in the group of men less than 40 years old the literate section makes up the majority. For women under 35 the situation gives a different impression: a considerable share of women in this age-group is literate, and in the age-group under 25 years for the first time only a minority of women remains illiterate.



Data: Survey by FU Berlin Team 2008; Data processing and Design: Benz 2008

Figure 9.16 Age structure and literacy in Shigar Proper



Highest level of education achieved (all persons aged 20 years and older); Data: Survey by FU Berlin Team 2008 ; Data processing and Design: Benz 2008

Figure 9.17 Educational status by gender in Shigar Proper

Taking a closer look at the graduation levels of these literate sections in the adult population, the before hinted gender gap becomes obvious (Figure 9.17). Males, in average, are much better educated than females. Not only do illiterate women account for a share of 76%, compared to 36% only for males. But also under those, who are literate, the majority of women has low educational graduations (Primary and Middle) only, whereas within the literate male population the majority has high school graduation or higher.
A hint for a shifting pattern is given in Figure 9.18. Here the same figures as discussed above are given for the young section of society, which will predetermine the future pattern of educational status and its gender balance in Shigar. Both, the share of illiterate women and men, have decreased remarkably to 10% illiterates in the male and 38% in the female section. As well, the share of educated women with high graduations has risen. Anyway, the gender gap still persists even among the young generation, as is clearly indicated in Figure 9.18.

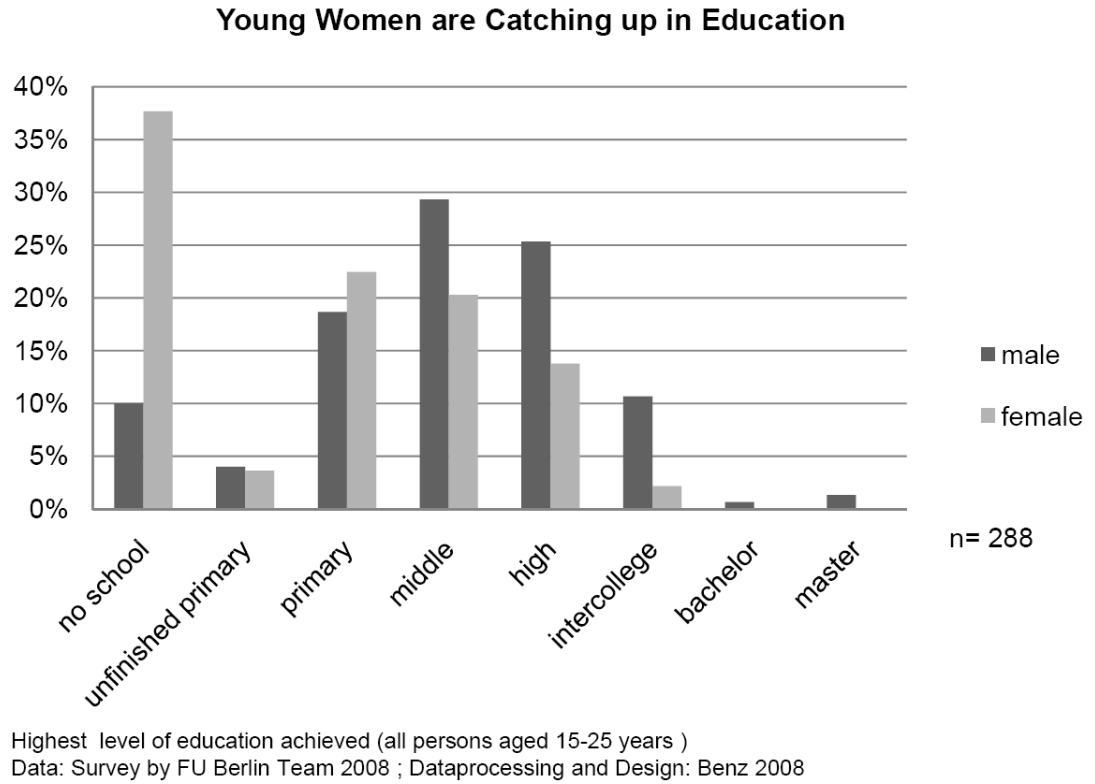


Figure 9.18 Educational status of the young generation

9.5.2 Trends of education in Shigar

The past trends and patterns of development which led to the present educational structure and status in Shigar can be derived from an age-group based analysis of the average educational attendance, as shown in Figure 9.19

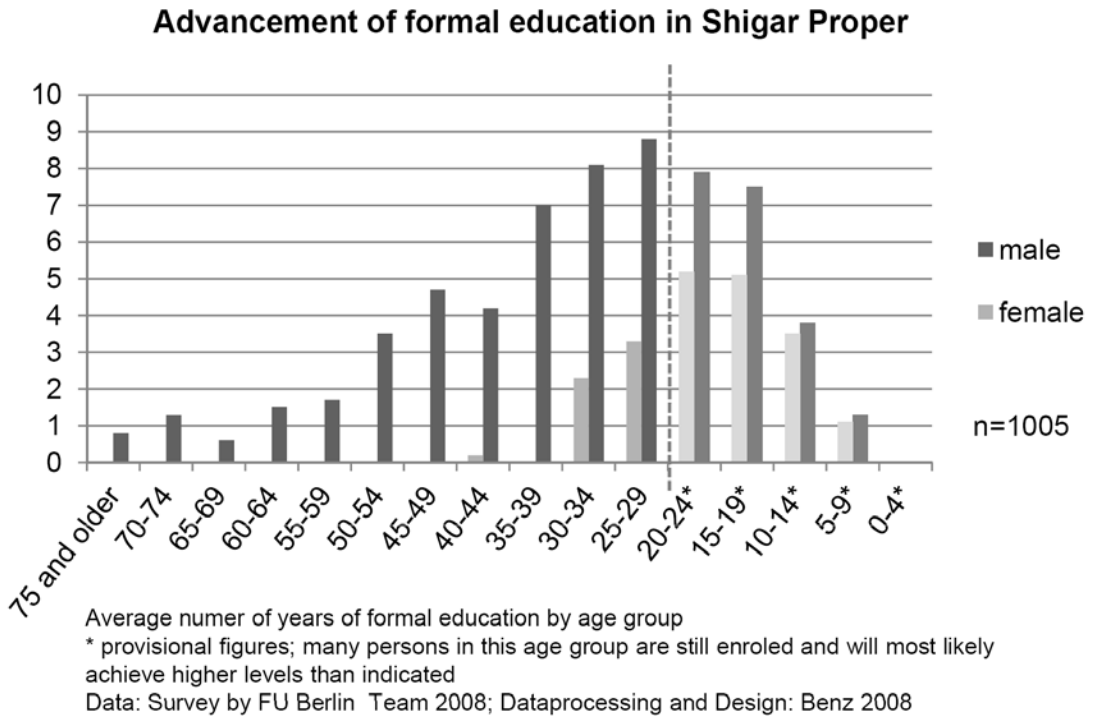


Figure 9.19 Status of education by age-groups and gender in Shigar Proper

The average educational attendance, measured in years of formal education, represents an indicator for the overall educational level achieved in the respective gender and age-group. For the male section of society, a long and steady increase in educational attendance is indicated in Figure 9.19. For the male section, this process started more than 70 years in the past and is still culminating with a preliminary peak at 8.3 years average educational attendance in the male age-group 25-29 years.

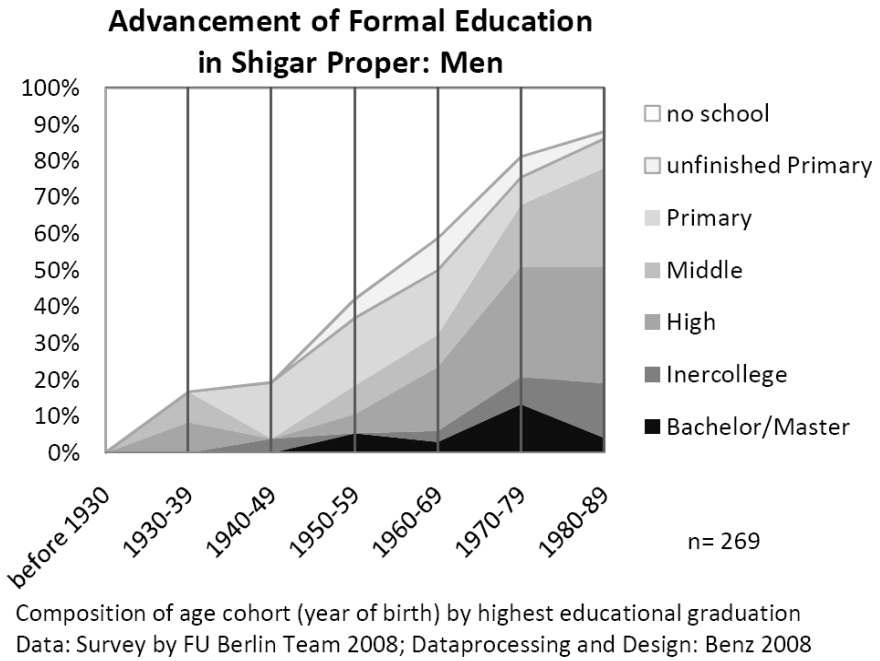
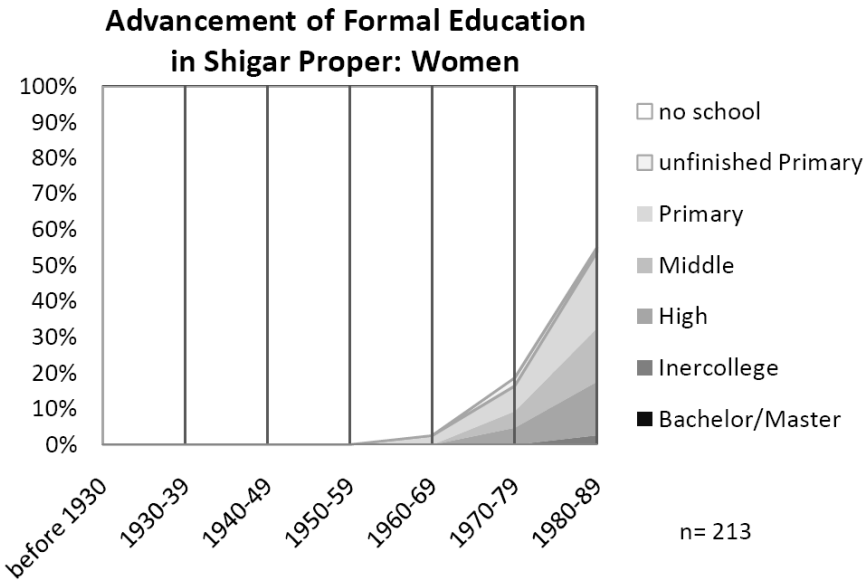


Figure 9.20 Trends of male education

For the female section the picture differs significantly. A similar process of steady increase did not start before the age cohort of women who are today 30-34 years old, which means a delay of about half a century compared to the men. Women started late, but with higher pace than their male counterparts. For the men it



Composition of age cohort (year of birth) by highest educational graduation
Data: Survey by FU Berlin Team 2008; Dataprocessing and Design: Benz 2008

Figure 9.21 Trends of female education

took almost four decades to let the illiteracy rate drop under 50% for the first time in an age cohort (Figure 9.20) whereas the same achievement for the women only took about two decades (Figure 9.21).

9.5.3 Student population of Shigar

Enrolled students account for 36.1% of the total population in Shigar. With a share of nearly 58% the majority of students is male (Table 9.2). The bigger part of the students is enrolled in pre-school and primary levels, comprising nearly 52% (Table 9.3). Slightly below 10% of all students are enrolled in higher education (intercollege level and higher). The gender parity is at all levels in favour of male students, except in middle school education. The male biased parity becomes more articulated at the levels of higher education, where 86% of all students enrolled are male.

Table 9.2 Students in Shigar by gender

	Shigar (2008)
Student share	
Share in total population	36.1%
Gender composition of enrolled students	
Male	57.7%
Female	42.3%

Data: Survey by FU Berlin Team 2008

Table 9.3 Students in Shigar by level

Level	**Share of all students**	**Ratio female/ male**
Pre-school	8.6%	0.68
Primary	44.1%	0.79
Middle	25.1%	1.16
High	12.7%	0.52
Intercollege	5.7%	0.17
Bachelor	2.4%	0.29
Master and higher	1.3%	0.00

Data: Survey by FU Berlin Team 2008

The primary net enrolment ratio for Shigar is slightly over 90% (Table 9.4). The gender gap in primary enrolment is reduced to a marginal difference of about 3% between male and female enrolment. This means, that about 8% of boys and 11% of girls in primary school going age are not enrolled in any school. But anyway, with these figures, Shigar has already achieved Goal 2 of the UN Millennium Development Goals, which is to achieve “universal primary education” (UN 2007:10) on a gender balanced basis.

Table 9.4 Primary net enrolment rate in Shigar

	Shigar (2008)
Primary net enrolment rate (age group 7-10)	
Total	91.1%
Male	92.4%
Female	88.9%

Data: Survey by FU Berlin Team 2008

9.5.4 Education and occupation

When asked about their motivation for the decision to send their sons and daughters to school, almost all parents expressed their wish to enable better off-farm income and job opportunities for their children. Education is seen as the very precondition for access to high status and high income occupation opportunities in- and outside the region. In a social system, where retirement age livelihoods nearly exclusively depend on support from the own sons, there is not only the parents’ wish to make a better life for the next generation possible a driving force, but also considerations about the own retirement benefits. Many parents consider their often huge investments of money, time and their renunciation of children’s contribution to domestic and agricultural workings as part of their retirement arrangements. Also, today the agricultural basis alone is no longer sufficient for sustaining the livelihoods in the region, and consequently off-farm income has become more and more important during the last decades. In Baltistan, the contribution of off-farm incomes to total incomes (including the assumed market value of agricultural products and by-products, which are not sold but consumed by the households themselves) has risen from 41% in 1991 to 53% in 2005 (AKESP 2007:16). Thus, off-farm incomes today constitute the main pillar on which rural livelihoods rest.

Decisions about educational attendance may be considered as a component of the broader livelihood strategies followed by the rural households with multifaceted interests and objectives. Regarding the fact that most of the education related livelihood strategies are aiming at expected improvement of job and income opportunities, it is worth to take a closer look at the de-facto correlation between educational and occupational status (Figure 9.22).

There is great evidence that the job opportunities are rising with better educational graduations. The share of those who are not in remunerated occupations is inverse proportional to the level of education. In the group of illiterate men, for example, the majority of 57% is not in remunerated occupation, whereas in the group of men with high school graduation (grade ten) or better the share of unemployed persons is only 8%. So, at least concerning the male

side, the expected enhancement of employment opportunities by formal education seems to proof true. Different from that is the picture in the female section of society, where employment still is a rather exceptional phenomenon even for high educated women. The great progress realized in female education in Shigar over the last decades did not (yet) transpose in rising female employment. In the group of women with less than high school graduation, the share of employed women is below 1%. Even in the group of women with high school education and better, employed women make up for only 23%. The majority of these women work in the education and health sector, which both are considered as two of the few socially and morally accepted female occupations in Shigar. The remaining vast majority of women not in remunerated occupation is doing domestic and agricultural work in their households.

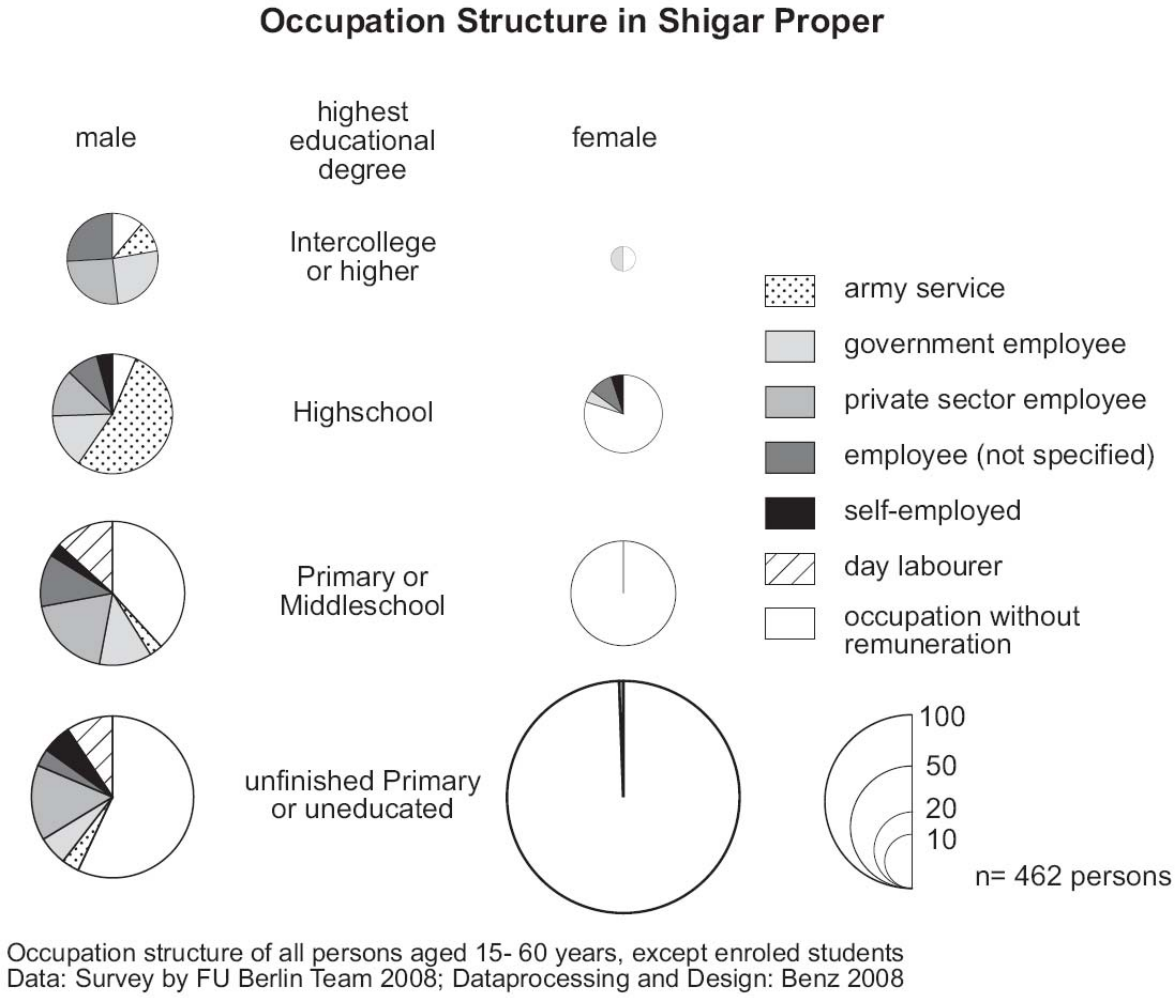


Figure 9.22 Occupation status by education level and gender

A closer look on the male persons with remunerated occupation shows that besides the highly sought-after government or private sector employment, the army service plays an important role (Figure 9.22). This is especially true for those men with high school graduation, which is due to the fact that a high school degree a few years before has been made a prerequisite for army recruitment. Army service enjoys a great popularity with young men, due to a secured long-lasting employment opportunity, relatively high guerdon, a transfer payment at the end of the service period and a lifelong pension payment. These after-service pay-

ments often form the basis for setting up a small business, like shops, workshops or restaurants. Remittances from persons in army service presently contribute to the financial income in about 17% of all households in Shigar. For these households, the received army remittances are of great importance and in average account for 62% of the total financial income in these households. Some households even depend entirely on the army remittances in their financial income sources. About 28% of households in Shigar receive army pension payments.

9.5.5 Migration and absent population of Shigar

Job opportunities for well-educated graduates and possibilities for enrolment in higher education beyond high school and intercollege level are rather limited in Shigar and the region, which leads to a significant phenomenon of temporary migration out of Shigar. Those absent persons, who are temporarily resident in other places than Shigar but who still belong to a household of Shigar, account for about 5% of the total population. This means that in roughly every second household of Shigar one person is absent. Please note that the statements made in the following are only with reference to those persons who still belong to a household in Shigar (although residing outside the village), and thus not include persons who ceased to be part of a Shigar household, e.g. by marriage of women to another village.

The overwhelming majority of these absent persons is constituted by young men between 20 and 29 years with an education level above average. Only about 4% women are found within the group of absent persons. In average, the absent persons show a medium level of 8.4 years formal education attendance, which is slightly higher than the expected medium of 7.7 years for a group with the same age and gender composition in the resident population.

There are two major reasons for temporary migration out of Shigar: employment and income generation on the one hand, and attainment of higher education on the other. One in four absentees left Shigar for getting higher education, mostly to graduate at intercollege, bachelor or master level. Almost all remaining 75% of absentees left Shigar for employment and income generation purposes. In this group, army service plays a particular role, regarding the fact that about 55% of the non-student absentees have joined the army service.

The big cities in “down country” Pakistan are the preferred destination of migration for 80% of the absentees, with an outstanding importance of Karachi, where every second Shigar absentee is staying. Within the Northern Areas, Skardu and Gilgit are the dominant destinations. Skardu is particularly significant for Intercollege students from Shigar. In the field of religious education, the city of Qom in Iran is the preferred destination among Shigar students.

9.6 Conclusion

Education is the key to sustainable development, to democracy and peace in and between nations. It is an important instrument to achieve freedom and social justice. Most important, education is a human right. Every child, boys and girls alike, should have access to at least primary education. One reason for not overcoming illiteracy, insufficient teacher training and high drop-outs has to been seen in insufficient in-vestment in human resources. Pakistan spends at least twice as much money in the military sector as in the education sector (SIDDIQA 2007).

At the World Conference for the “Education for All” in Jomtien 1990, an essential result was the ambition for schooling for every child all over the world:

“We, the participants in the World Conference on Education for All, reaffirm the right of all people to education. This is the foundation of our determination, singly and together, to ensure education for all. We commit ourselves to act cooperatively through our own spheres of responsibility, taking all necessary steps to achieve the goals of education for all. Together we call on governments, concerned organizations and individuals to join in this urgent undertaking. The basic learning needs of all can and must be met.” (UNESCO 2000: 77)

This ambition has been confirmed at all subsequent conferences in the following years.
The question is, however, how does the actual educational situation in Shigar look like? As has been shown in this report, some progress has been achieved over the past years. This may be a result of the different education projects realized in the past in Shigar. It is now important to tie in with these results and to keep on focusing on education.
Nevertheless, it is to make a note on the fact, that there are more students enrolled in preschool classes than in high schools or colleges (Figure 9.5). Obviously students in Shigar often do not go for higher education. Therefore a number of reasons may be mentioned: Although no school fees need to be paid in most schools in Shigar, it is still too expensive for some families to send every child to school or furthermore to high school and college. This relates to the fact, that some parents do not see the importance of education, especially for girls’ education and for higher education. Most of the parents believe, according to the answers of the teachers, their children will not find a job anyway, even if they are educated or not. As shown in the previous chapters of this report, practising agriculture alone is no longer sufficient for sustaining a livelihood in Shigar. People strongly rely on other sources of income, and finding jobs without education today is almost with no reasonable chance.
The figures shown in this chapter also demonstrate the inequality between male and female students. Indeed, till the end of the 1990s the number of girls’ primary schools increased significantly. Nevertheless, the condition of girls’ schools is worse than that of boys’ schools. The inequality between the different genders is part of an overall challenge which includes the gender discrimination and the economic and political disadvantages girls and women have to face.
Most important to deal with is the difficulty for girls to gain access to school. Girls face cultural barriers concerning their roles in home and society (EDUCATION FOR ALL 2007:39). Poverty and long distances to schools are other reasons. The challenge is to deal with this subject and to develop structures in which more and more female students will also have the chance to participate in the educational system.
Moreover, there might be another problem as to name lack of schools for higher education. On the one hand, there are enough primary schools in Shigar, but there would not be enough high schools, especially in the periphery of Shigar if every student went on for higher education.
In addition, there is yet one college under construction, but this will be a college only for male students. Female students who would like to go to a college have to go to Skardu. This might be a reason for parents not to send their girls to college.

But even if there are sufficient primary schools, the number of teachers remains too low to deal with the high number of students.
Despite the fact that the Government of Pakistan puts a high emphasis on primary education, the reality is quite the opposite. Overall primary schools in Shigar are disregarded in many aspects compared to middle schools or high schools. In primary schools there are less qualified teachers, the teaching and learning environment is less equipped, the budget is lower and the teacher student ratio is higher.
During the 1990ies many schools were established in Shigar, but there was no in-crease in the number of teachers. It is not enough only to construct school buildings.
The importance of primary education is noted in so many documents and declarations; now it's up to the Government of Pakistan, in particular to the Ministry of Education, to take action in accordance with all these ambitions.
In the following, selected results of the field research are visualised in an evaluation matrix (Figure 9.23) demonstrating strengths as well as weaknesses of each school in Shigar. The matrix consists of schools listed by their respected names. They are arranged by school level from primary to high school. The schools are evaluated according to selected indicators already discussed in the previous chapters. In this regard the schools can be compared regarding the number of teachers per class, the professional qualification of the teachers, learning environment, availability of teaching material, the budget per student as well as the number of meetings. Furthermore, the results of a self-evaluation by the teachers of the schools visited are included in the final column. Each indicator in the matrix is classified into four categories ranging from high level to low level visualised with different colours. In this regard the matrix shows deficits or shortages of primary, middle and high schools as well as of the college, not only in general but in particular for each school. According to the matrix it becomes clear that the primary schools, and particularly the community schools, have much more deficits in the field of number of teachers, qualification of teachers as well as learning environment and availability of teaching material than middle and high schools. Therefore, the final conclusion is that primary schools urgently need more attention and improvements, respectively.

Evaluation Matrix Schools in Shigar

Primary Schools	No. of teachers per class	Teacher's qualification	Learning environment	Availability of teaching material	Budget per student enrolled	No. of meetings	Evaluation of schools by (head) teacher
F.G. Boys Primary Markunja							no data
F.G. Boys Primary Shigar Khas			4 class rooms for 8 classes				no data
Boys Primary School Senkhor			4 rooms for 6 classes	No teaching kit, models, books			
Boys Primary School Akbarabad			3 class rooms for 7 classes	No maps, books, models			
F.G. Boys Primary School Lamsa			2 class rooms for 6 classes				
F.G. Boys Primary School Thugmo		no data	3 class rooms for 6 classes	No models, maps	no data		
F.G. Girls Primary Todkhor Khan (Shopa)			2 class rooms for 5 classes				no data
Akbariyya Girls Primary School Shigar			5 class rooms for 7 classes			no data	no data
F.G. Girls Primary School Byasingpa			4 class rooms for 6 classes	No models, library			
F.G. Girls Primary School Rupa			2 class rooms for 6 classes, Sanitation under construction	No books, slide rule			
F.G. Girls Primary School Rompa			No electricity	Charts are destroyed by mice			
SAP Community Primary School Daskhor			2 class rooms for 4 classes	No models, books			
SAP Community Girls School Thugmo			4 class rooms for 6 classes	No books, models, globe			
SAP Community Girls Primary School Kothang Pain			No class rooms at all				
Indicators	No. of teachers per class	Teacher's qualification	Learning environment	Availability of teaching material	Budget per student enrolled	No. of meetings	Evaluation of schools by (head) teacher

Middle Schools	No. of teachers per class	Teacher's qualification	Learning environment	Availability of teaching material	Budget per student enrolled	No. of meetings	Evaluation of schools by (head) teacher
F.G. Boys Middle School Kothang/ Marapi			8 class rooms for 10 classes	No s-l & c-l (only 1 PC), no room for books			
USWA Boys Public Middle School Shigar				no data			no data
F.G. Girls Middle School Marapi			4 class rooms for 9 classes new building under construction	No library, lab, models, posters			
Ladha Girls Middle School Marapi Bul			11 class rooms for 12 classes			no data	no data
Madrasa Jamia Imamia Shigar Khas			no data	no data		no data	no data

Classification	No. of teachers per class	Teacher's qualification	Learning environment	Availability of teaching material*	Budget per student enroled	No. of meetings	Evaluation of schools by (head) teacher
HIGH RANKING	No. of teachers >no. of classes	(PhD), Master degree on average	Sanitation, electricity, no. of class rooms=no. of classes	Various Types	> 400 Rs	1 meeting/ month	Good
MEDIUM-HIGH RANKING	No. of teachers =no. of classes	Master & Bachelor degree on average	Sanitation, no. of class rooms =no. of classes	Various types but no b, c-l, s-l or l	200- 400 Rs	1 meeting per year	Satisfactory
LOW-MEDIUM RANKING	No. of teachers <no. of classes	Bachelor degree & intercollege on average	No sanitation or electricity, no. of class rooms<no. of classes	Only charts, posters or maps	< 200 Rs	Meetings held occasionally	Insufficient
LOW RANKING	1 teacher=2 or more classes	no data	no data	no data	no data	no data	no data
NO DATA	no data	no data	no data	no data	no data	no data	no data

* various types of material include books (b), charts, posters, maps, models, globe, etc. For school above primary level material also comprise library (l), science (s-l) and computer lab

High Schools and College	No. of teachers per class	Teacher's qualification	Learning environment	Availability of teaching material*	Budget per student enroled	No. of meetings	Evaluation of schools by (head) teacher
F.G. Boys High School Shigar			7 class rooms for 9 classes			no data	no data
Tameer-e-Milad Community Model School Shigar Khas				No s-l & l		no data	no data
Sunrise Grammar Public School			3 class rooms for 4 classes	no data		no data	no data
F.G. Girls High School Shigar						no data	no data
F.G. Inter College Shigar				No maps, no s-l		no data	no data
Classification	No. of teachers per class	Teacher's qualification	Learning environment	Availability of teaching material*	Budget per student enroled	No. of meetings	Evaluation of schools by (head) teacher
HIGH RANKING	No. of teachers >no. of classes	(PhD), Master degree on average	Sanitation, electricity, no. of class rooms=no. of classes	Various Types	> 400 Rs	1 meeting/ month	Good
MEDIUM-HIGH RANKING	No. of teachers =no. of classes	Master & Bachelor degree on average	Sanitation, no. of class rooms =no. of classes	Various types but no b, c-l, s-l or l	200- 400 Rs	1 meeting per year	Satisfactory
LOW-MEDIUM RANKING	No. of teachers <no. of classes	Bachelor degree & intercollege on average	No sanitation or electricity, no. of class rooms<no. of classes	Only charts, posters or maps	< 200 Rs	Meetings held occasionally	Insufficient
LOW RANKING	1 teacher=2 or more classes	Intercollege & matricula-tion on average	No sanitation, electricity, no. of class rooms<no. of classes	No material at all	0 Rs	No meetings at all	Very bad
NO DATA	no data	no data	no data	no data	no data	no data	no data

* various types of material include books (b), charts, posters, maps, models, globe, etc. For school above primary level material also comprise library (l), science (s-l) and computer lab

Figure 9.23 School evaluation matrix for Shigar Proper
Data: Survey by Benz, Mahrwald & Neutz, 2008; Design: Mahrwald & Neutz 2008

10. References and further reading

AFRIDI, B.G. (1988): Baltistan in history. Peshawar.

AHMED-GHOSH, H.: Agricultural Development and Work Pattern of Women in a North Indian Village, in: RAJU, S. & D. BAGCHI (Ed.) (1993): Women and Work in South Asia. Regional Patterns and Perspectives, London.

AKF (2006): Environment and development. Lausanne.

AKF (2007): Education in the Northern Areas. Geneva.

AKTC (2005): Historic Cities Support Programme: Conservation and Development in Hunza and Baltistan. Lausanne.
http://www.akdn.org/hcsp/pakistan/NA_Conservation.pdf. Accessed: June 2008.

AKTC (2007): Brochure 2007. Lausanne.
http://www.akdn.org/aktc/AKTC_Brochure2007.pdf. Accessed: June 2008.

ALI, S. S. (2000): Gender and Human Rights in Islam and International Law: Equal Before Allah, Unequal Before Man? The Hague.

AGARWAL, B. (1994): A field of one's own. Gender and land rights in South Asia. South Asian Studies 58, Cambridge.

ASENSO-OKYERE, K. (2008): Infrastructure and poverty. Make rural development happen. In: Development & Cooperation, Vol. 49, No. 1.
http://www.inwent.org/ez/articles/065095/index.en.shtml. Accessed: May 2008.

BACKSTROM, P.C. (1992): Balti. In: BACKSTROM, P.C. & C.F. RADLOFF (Eds.): Languages of Northern Areas. (= Sociolinguistic Survey of Northern Pakistan 2). Islamabad. pp. 3-27.

BESIO, K. (2005): Telling stories to hear autoethnography: Researching women's lives in northern Pakistan. In: Gender, Place and Culture, Vol. 12, No. 3, pp. 317-332.

BUTZ, D. & K. BESIO (2004): The value of autoethnography for field research in transcultural settings. In: Professional Geographer, Vol. 56, No. 3, pp. 350-360.

BUZDAR, N. (1988): Property rights, social organization, and resource management in Northern Pakistan. (= Environment and Policy Institute, Working Paper 5). Honolulu.

CHAND, R. (1997): Agricultural diversification and development of mountain regions. New Delhi.

CLEMENS, J. & M. NUESSER (1996): Impacts on mixed mountain agriculture in the Rupal Valley, Nanga Parbat, North Pakistan. In: Mountain Research and Development, Vol. 16, No. 2, pp. 117-133.

CLEMENS, J. (1998): Problems and limitations of rural energy supply in mountainous regions of Northern Pakistan - A case study on the Astor Tahsil and the Northern Areas. In: STELLRECHT, I. (Ed.):Karakorum, Hindukush, Himalaya: Dynamics of change. (= Culture Area Karakorum Scientific Studies, Vol. 4). Köln. pp. 475-496.

CLEMENS, J. (2001): Ländliche Energieversorgung in Astor: Aspekte des nachhaltigen Ressourcenmanagements im nordpakistanischen Hochgebirge. (= Bonner Geographische Abhandlungen, Vol 106), Witterschlick.

CRESWELL, J. (2002): Research design: Qualitative, quantitative, and mixed methods approaches (2nd edition). Thousand Oaks, CA.

DAINELLLI, G. (1924): Le case dei Balti. In: Relazione Scientifice della Spedizione Italiana de Filippineli Himalaia, Caracorum e Turchestan Chinese (1913- 1914), Ser II: Resultati Geologici e Giografici – Vol 8 Le Condizione delle Genti. Nicola Zanichelli, Bologna, 53-69.

DAUER, S. (2001): Indivisible or invisible. Women's human rights in the public and private sphere, in: AGOSÍN, MARJORIE: Women, gender, and human rights: a global perspective. New Brunswick (USA).

DERBYSHIRE, E., FORT, M. & L. OWEN (2001) : Geomorphological hazards along the Karakoram Highway: Khunjerab Pass to the Gilgit River, northernmost Pakistan. In: Erdkunde Vol. 55, No. 1, pp. 49-71.

DITTMANN, A. (1997): Ethnic groups and bazaar economy in Baltistan. In: DODIN, T. & H. RAETHER (Eds.): Recent research on Ladakh. Proceedings of the 7th colloquium of the International Association for Ladakh Studies held in Bonn/Sankt Augustin, 12 - 15 June 1995. (= Ulmer Kulturanthropologische Schriften, Vol. 9). Ulm. pp. 117-134.

DITTMANN, A. (2000) (Ed.): Mountain societies in transition – Contributions to the cultural geography of the Karakorum. Köln.

DITTMANN, A. & E. EHLERS (2004): Montane Milieus: Verkehrserschließung und Siedlungsentwicklung unter besonderer Berücksichtigung des Karakorum Highway/Pakistan. In: Alpenwelt - Gebirgswelten: Inseln, Brücken, Grenzen. Bern. pp. 289-297.

EFA (2008): Education for All Global Monitoring Report 2008. Education for All by 2015. Will we make it? Paris.

EHLERS, E. & H. KREUTZMANN (Eds.) (2000): High mountain pastoralism in Northern Pakistan. (= Erdkundliches Wissen, Vol. 132). Stuttgart. pp. 37-58.

ESMAP (2006): Pakistan Household Use of Commercial Energy. Washington D.C.

FAZLUR-RAHMAN (2000): Community Organization and Management of Natural Resources in the Northern Areas of Pakistan: A Study of Astor Valley. In: DITTMANN (Ed.): Mountain Societies in Transition. Contributions to the Cultural Geography of the Karakorum. Cologne, pp. 65-85.

FAZLUR-RAHMAN (2007): Persistence and Transformation in the Eastern Hindu Kush: A Study of Resource Management Systems in Mehlp Valley, Chitral, North Pakistan. (= Bonner Geographische Abhandlungen, Vol. 118), Sankt Augustin.

FAO (1999): Forestry department: livestock in mixed farming systems of the Hindu Kush-Himalayas: Trends and sustainability.
http://www.fao.org/docrep/X5862E/x5862e00.HTM. Accessed: April 2008.

FEDERAL FOREIGN MINISTRY OF GERMANY: Pakistan, Kultur- und Bildungspolitik, October 2007, http://www.auswaertigesamt.de/diplo/de/Laenderinformationen/Pakistan/ Kultur-UndBildungspolitik.html. Accessed: May 2008.

FELMY, S. (1993): Division of Labour and Women's Work in a Mountain Society, Hunza Valley in Pakistan. In: RAJU, S. & D. BAGCHI (Eds.): Women and Work in South Asia. Regional Pattern and Perspectives. London, New York, pp. 196-208

FREY, R. (2003): Gender im Mainstreaming. Geschlechtertheorie und -praxis im internationalen Diskurs. Königstein/Taunus.

GOP MINISTRY OF EDUCATION (1992): National education policy, Islamabad.

GOP MINISTRY OF EDUCATION (1998): National education policy 1998-2010, Islamabad.

GOP MINISTRY OF EDUCATION (2002): Education sector reform: action plan 2001-2005, Islamabad.

GOP MINISTRY OF EDUCATION (2003a): Quality of primary education in Pakistan. Islamabad.

GOP MINISTRY OF EDUCATION (2003b): National plan of action on education for all (2001-2015) Pakistan. Islamabad.

GOP MINISTRY OF EDUCATION (2006): Pakistan Education Statistics 2005-06, Islamabad.

GOP MINISTRY OF FINANCE (2008): Pakistan economic survey 2004-05. http://www.finance.gov.pk/survey/home.htm. Accessed: February 2008.

GOP MINISTRY OF KASHMIR AFFAIRS AND NORTHERN AREAS (2006): Statistical year book 2005-2006, Islamabad.

GOP, PLANNING COMMISSION OF PAKISTAN (1988): Seventh five year plan (1988-93), Islamabad.

GOP, PLANNING COMMISSION OF PAKISTAN (2004): Pakistan millennium development goals report 2004, Islamabad.

GOP POPULATION CENSUS ORGANISATION (1972): Population Census of Northern Areas 1972: district census report Baltistan. Islamabad.

GOP POPULATION CENSUS ORGANISATION (1984): 1981 District Census Report of Baltistan. Islamabad.

GOP POPULATION CENSUS ORGANISATION (2000): 1998 District census report of Baltistan. Islamabad.

GOP PLANNING COMMISSION (2004): Pakistan millennium development goals report 2004, Islamabad.

GRATZ, K. (2006): Verwandtschaft, Geschlecht und Raum. Aspekte weiblicher Lebenswelt in Gilgit/ Nordpakistan (=Culture Area Karakorum Scientific Studies; Vol 11), Köln.

HALVORSON, S. (2003): A geography of children's vulnerability: Gender, household resources, and water related disease hazard in Northern Pakistan. In: The Professional Geographer, Vol. 55, No. 2, pp. 120-133.

HASERODT, K. (1984): Abflußverhalten der Flüsse mit Bezügen zur Sonnenscheindauer und zum Niederschlag zwischen Hindukush (Chitral) und Hunza Karakorum (Gilgit, Nordpakistan). In: Mitteilungen der Geographischen Gesellschaft in München, Vol. 69, pp. 129-161.

HASERODT, K. (1989): Chitral (pakistanischer Hindukush). Strukturen, Wandel und Probleme eines Lebensraumes im Hochgebirge zwischen Gletschern und Wüste. In: HASERODT, K. (ed.): Hochgebirgsräume Nordpakistans im Hindukush, Karakorum und Westhimalaya (Beiträge und Materialien zur Regionalen Geographie, No.2), pp. 43-180.

HEINE, I. & P. HEINE (1993): O ihr Musliminnen. Frauen in islamischen Gesellschaften. Freiburg.

HEWITT, F. (1989): Woman's work, woman´s place: the gendered life-world of a high mountain community in Northern Pakistan. In: Mountain Research and Development, Vol. 9, No. 4, pp. 335-352.

HEWITT, F. (1991): Women in the landscape: a Karakoram village before „development". (Unpublished Ph.D. Thesis). Waterloo.

HOLY QUR'AN, http://www.quran-online.de/quran/s_quran.htm. Accessed: February 2008.

HUGHES, R. (2005): Vernacular architecture and construction techniques in the Karakoram. In: Bianca, S. (ed.): Hidden Treasures of the Karakorums - The rehabilitation of cultural heritage in Pakistan's Northern Areas. Geneva. pp.99-132.

HUGHES, R. & D. LEFORT (2006): The conservation of Baltit Fort 1981.1996. In: KREUTZMANN, H. (Ed.) (2006): Karakoram in transition. Culture, development and ecology in the Hunza Valley. Oxford, New York, Karachi, pp. 293-304.

HUSSAIN, A. & A.M. LANGENDIJK (1995): Self-help rural water supply schemes: Lessons learned from the Northern Areas of Pakistan. Gilgit, Pakistan. (=Issue Paper 4/ Water, Sanitation, Hygiene and Health Studies Project Northern Areas and Chitral)

ICRW (2007): Learning how to better promote, protect and fulfil women's property rights. New Delhi. http://www.icrw.org/docs/property-rights/2007-learning-how-to-promote.pdf. Accessed: June 2008.

IUCN (2003): Northern Areas strategy for sustainable development, background paper energy. Karachi.

IUCN (2007): Socio-economic base line of Shigar. Karachi.

KHAN, M. I. (2003): Communication for sustainable development – Northern Areas strategy for sustainable development. IUCN. Karachi.

KOLB, H. (1994) Abflußverhalten von Flüssen in den Hochgebirgen Nordpakistans. Grundlagen, Typisierung und bestimmende Einflußfaktoren an Beispielen. In: HASERODT, K. (ed.): Physisch-geographische Beiträge zu Hochgebirgsräumen Nordpakistans und der Alpen (Beiträge und Materialien zur Regionalen Geographie, No. 7), pp. 23-113.

KORPUT, J. V., LANGENDIJK, D., MUNEEBA, M. & A. HUSSAIN (1994): Water, sanitation, hygiene and health. Baltistan, Gilgit, Pakistan. (= Position Paper / Water, sanitation, hygiene and health studies project (Pakistan).

KREUTZMANN, H. (1988): Oases of the Karakorum: Evolution of the Irrigation and Social Organisation in Hunza, North Pakistan. In: ALLAN, N. J. R., KNAPP G. W. & C. STADEL (ed.): Human Impact on Mountains. New Jersey, pp. 243-254.

KREUTZMANN, H. (1989): Hunza. Ländliche Entwicklung im Karakorum. (Abhandlungen – Anthropogeographie, Vol. 44). Berlin.

KREUTZMANN, H. (1990): Oasenbewässerung im Karakorum. Autochthone Techniken und exogene Überprägung in der Hochgebirgslandschaft Nordpakistans. In: Erdkunde, Vol. 44, No. 1, pp. 10-23.

KREUTZMANN, H. (ed.) (2000a): Sharing water: irrigation and water management in the Hindukush - Karakoram - Himalaya. Oxford.

KREUTZMANN, H. (2000b): Water Management in Mountain Oases of the Karakoram. In: KREUTZMANN, H. (Ed.): Sharing Water. Irrigation and Water Management in the Hindukush – Karakoram – Himalaya. Oxford, pp. 90-115.

KREUTZMANN, H. (2000C): Improving Accessibility for Mountain Development. Role of Transport Networks and Urban Settlements. In: Banskota, M., Papola, T. S. & J. Richter (Eds.): Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia. Proceedings of the International Conference held from 31 January – 4 February 2000 in Kathmandu, Nepal, pp. 485-513.

KREUTZMANN, H. (2003): Development problems in the mountain regions of Northern Pakistan. In: MUFTI, S. A., HUSSAIN, S. S. & A.M. KHAN (eds.): Mountains of Pakistan: Protec-

tion, potentials and prospects. Islamabad: Global Change Impact Studies Centre, pp. 164-179.

KREUTZMANN, H. (2004): Accessibility for High Asia. Comparative perspectives on Northern Pakistan's traffic infrastructure and linkages with neighbours in the Hindukush-Karakoram-Himalaya. In: Journal of Mountain Science, Vol. 1, No. 3, pp. 193-210.

KREUTZMANN, H. (2005a): Linguistic diversity in space and time: a survey in the Eastern Hindukush and Karakoram. In: Himalayan Linguistics 4. Web-Journal http://www.uwm.edu/Dept/CIE/HimalayanLinguistics/Journal_2005/Kreutzmann_HLJ4.pdf. Accessed: September 2007.

KREUTZMANN, H. (2005b): Pastoral practices and their transformation in the North-Western Karakoram. In: Nomadic Peoples, Vol. 8, No. 2, pp. 54-88.

KREUTZMANN, H. (2005c): Selected bibliography on Northern Pakistan: Reference, research and documentation. In: BIANCA, S. (ed.): Karakoram. Hidden treasures in the Northern Areas of Pakistan. Turin, pp. 313-320.

KREUTZMANN, H. (2005d): The Karakoram landscape and the recent history of the Northern Areas. In: BIANCA, S. (ed.): Karakoram. Hidden treasures in the Northern Areas of Pakistan. Turin, pp. 41-76.

KREUTZMANN, H. (2006): High mountain agriculture and its transformation in a changing socio-economic environment. In: KREUTZMANN H. (ed.): Karakoram in transition. Culture, development and ecology in the Hunza Valley. Oxford, New York, Karachi, pp. 329-358.

LABBAL, V. (2000): Traditional Oases of Ladakh: A Case Study of Equity in Water Management. In: KREUTZMANN, H. (ed.): Sharing Water. Irrigation and Water Management in the Hindukush – Karakoram – Himalaya. Oxford, pp. 163-183.

LENTZ, S. (2000): Rechtspluralismus in den Northern Areas/Pakistan (=Culture Area Karakorum scientific studies; Vol 9), Köln.

MALIK, M. Bashir (1961): Census of Northern Areas, 1961. Agency Census Report. Baltistan Agency. Parts I-V: Vol.6.

MASOOD KHAN (2005): Restoring and adapting Shigar Fort/Palace. In: Bianca, S. (ed.): Hidden Treasures of the Karakorums - The rehabilitation of cultural heritage in Pakistan's Northern Areas. Geneva. pp. 215-238.

MASOOD KHAN (2006): Conceptual planning in the Karakoram: The built heritage and dynamics of institution building. In: KREUTZMANN, H. (Ed.) (2006): Karakoram in transition. Culture, development and ecology in the Hunza Valley. Oxford, New York, Karachi, pp. 305-319.

MEHDI, R. (2001): Gender and Property Law in Pakistan. Resources and Discourses. Copenhagen.

MUMTAZ, K. (2007): Gender and poverty in Pakistan. In: Development, Vol. 50, No. 2, pp. 149-153.

MUMTAZ, K. & M.M. NOSHIRWANI (2006): Women's access and rights to land and property in Pakistan (Scoping Study). http://www.shirkatgah.org/Women_access-rights-to_land_property_in_Pakistan.pdf. Accessed: May 2005.

NUESSER, M. (2000): Change and persistence: Contemporary landscape transformation in the Nanga Parbat region, Northern Pakistan. In: Mountain Research and Development, Vol. 20, No. 4, pp. 348-355.

NYBORG, I. (2002): Yours Today, Mine Tomorrow? A Study of Women and Men's Negotiation Over Resources in Baltistan, Pakistan, PhD Dissertation No.1, Noragric, Centre for International Environment and Development Studies, Agricultural University of Norway (NLH).

POLZER, C. & M. SCHMIDT (2000): The transformation of political structure in Shigar Valley / Baltistan. In: DITTMANN, A. (Ed.): Mountain societies in transition: contributions to the cultural geography of the Karakorum. (= Culture Area Karakorum Scientific Studies, Vol. 6). Köln. pp. 179-210.

RHOADES R.E. & S.I.THOMPSON (1975): Adaptive strategies in alpine environments: beyond ecological particularism. In: American Ethnologist, Vol.2 No.2, pp. 535-551.

ROOHI, T. (2003): Non-Governmental Organisations - Northern Areas strategy for sustainable development. IUCN. Karachi.

ROSEMANN, N. (2005): Drinking Water Crisis in Pakistan and the Issue of Bottled Water. The Case of Nestlé's 'Pure Life'. Islamabad. http://www.humanrights.ch/home/upload/pdf/050829_drinkingwaterpakistan_rosemann2005.pdf. Accessed: June 2008.

SAID, M. (1998): Natural hazards of Shigar Valley, Northern Areas of Pakistan. In: STELLRECHT, I. (Ed.): Karakorum - Hindukush - Himalaya: Dynamics of change. (= Culture Area Karakorum Scientific Studies, Vol. 4/I). Köln. pp. 251-268.

SATHAR, Z./KASI, S. (1997): Women's autonomy, livelihood and fertility: A study of rural Punjab. Islamabad.

SCHMIDT, M. (2000): Pastoral system in Shigar/Baltistan: communal herding management and pasturage rights. In: EHLERS, E. & H. KREUTZMANN (Eds.): High mountain pastoralism in Northern Pakistan. (= Erdkundliches Wissen, Vol. 132). Stuttgart. pp.121-150.

SCHMIDT, M. (2004a): Boden- und Wasserrecht in Shigar, Baltistan: Autochthone Institutionen der Ressourcennutzung im Zentralen Karakorum. (= Bonner Geographische Abhandlungen, Vol. 112). Sankt Augustin.

SCHMIDT, M. (2004b): Interdependencies and reciprocity of private and common property resources in the Central Karakorum. In: Erdkunde, Vol. 58, No. 4, pp. 316-330.

SCHMIDT, M. (2006): Lokales Wassermanagement im Hochgebirge. Angepasste Nutzung einer Allmende-Ressource in Baltistan (Nordpakistan). In: Geographische Rundschau, Vol. 58, No. 2, pp. 49-56.

SCHULER, S. (1978): The „Story of the creation of Shigar" of Wazir Ahmad. In: Central Asiatic Journal, Vol. 22, pp. 102-120.

SDPI (2006): Women's land rights in Pakistan. http://www.sdpi.org/research_Programme/human_development/womens_land_rights.htm. Accessed: February 2008.

SIDDIQA, A. (2007): Military Inc. Inside Pakistan´s Military Economic, London.

STELLRECHT, I. (1997): The past and the present – Horizons of remembering in the Pakistan Himalaya. (= Culture Area Karakorum Scientific Studies, Vol. 3). Köln.

STELLRECHT, I. (1998): Bibliography – Northern Pakistan. (= Culture Area Karakorum Scientific Studies, Vol. 1). Köln.

STOEBER, G. (2000): Irrigation Practice in Yasin, Northern Areas of Pakistan. In: KREUTZMANN, H. (ED.): Sharing Water. Irrigation and Water Management in the Hindukush – Karakoram – Himalaya. Oxford, pp. 90-115.

STOEBER, G. & H. HERBERS (2000): Animal husbandry in domestic economies: Organization, legal aspects and present changes of mixed mountain agriculture in Yasin (Northern Areas, Pakistan). In: EHLERS, E. & H. KREUTZMANN (Eds.): High Mountain Pastoralism in Northern Pakistan. (Erdkundliches Wissen 132). Stuttgart, pp. 37-58.

TULACHAN, P. M. (2001): Mountain agriculture in the Hindu Kush-Himalaya: A regional comparative analysis, in: Mountain Research and Development, Vol. 21, No. 3, pp. 260-267.

UN (2007): The Millennium Development Report 2007, New York.

UNESCO (2006): Water. A shared responsibility. The United Nations world water development report 2. Paris, New York.

UNESCO (2008): Institute for statistics. Statistics in brief. Education in Pakistan. http://stats.uis.unesco.org/unesco/TableViewer/document.aspx?ReportId=289&IF_Language=eng&BR_Country=5860&BR_Region=40535 Accessed: March 2008.

UNDP PAKISTAN (2005): Gender roles and gender Issues. In: Planning and development division and departments projects. (Powerpoint available on request)

VICTORIA, J. (1998): Hydropower - An energy source for the Northern Areas of Pakistan. In: STELLRECHT, I. (Ed.):Karakorum, Hindukush, Himalaya: Dynamics of change. (= Culture Area Karakorum Scientific Studies, Vol. 4/II). Köln. pp. 431-442.

VRIES, S. DE (1998): Old people and modern life in the Shigar Valley of Baltistan (Northern Pakistan). In: STELLRECHT, I. (Ed.): Karakorum - Hindukush - Himalaya: dynamics of change. (= Culture Area Karakorum Scientific Studies 4/II). Köln. pp. 509-526.

WHO (2006): Guidelines for Drinking-Water Quality. 3rd ed. Geneva.

WHO & GOP – MINISTRY OF HEALTH (2006): Quality Drinking Water: Standards for Pakistan. Islamabad.

WHO & UNICEF (2006): Meeting the MDG Drinking Water and Sanitation Target. The Urban and Rural Challenge of the Decade. MDG Assessment Report. Geneva.

WORLD BANK (1996): Rural energy and development. Improving energy supplies for 2 billion people. Washington, D.C.

WORLD BANK (1996): The Aga Khan Rural Support Program. A third evaluation. (= World Bank operations evaluation study). Washington, D.C.

WORLD BANK (1997): Staff appraisal report – Pakistan, Northern education project. Washington, D.C.

WORLD BANK (2002): The next ascent. An evaluation of the Aga Khan Rural Support Program, Pakistan. (= World Bank operations evaluation study) Washington, D.C.

WORLD BANK (1997): Staff appraisal report – Pakistan, northern education project, 30 September 1997, http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/1997/09/30/000009265_3980420170649/Rendered/PDF/multi_page.pdf. Accessed: June 2008.

WORLD CONFERENCE ON EDUCATION FOR ALL (1990): World declaration on education for all and framework for action to meeting the basic learning needs, 5-9 March 1990, Jomtien (Thailand).

WORLD EDUCATION FORUM (2000): The Dakar framework for action, education for all: Meeting our collective commitments, 26-28 April 2000, Dakar.

11. Glossary, abbreviations and measurement units

A – Arabic
B – Balti
U – Urdu

alim	A	(pl. *ulama*) Muslim religious scholar, clergyman
alu	U	potato (Solanum tuberosum)
bloq	B	high pasture
chudong	B	traditional water storage pit, connected to irrigation canal
hiba	A	gift, literally: "gift from God"
hnang	B	border irrigation
hrkong, hrka	B	canal
hrkong-pa	B	canal watchman
hyaq	B	yak (Bos grunniens)
imambara (or *imambar-gahs*)	A	religious meeting places
jamabandi	U	settlement records
katsa	B	traditional balti winter living quarter
khar khong	B	hole in the floor giving access to the *katsa*
lungma	B	valley, high pasture
madrasa	A	Islamic religious school
mahram	A	kin and in-laws of the opposite sex, whom a Muslim is not allowed to marry
mauza	U	administrative unit (municipality)
nālā	U	side valley stream
nang	B	traditional balti house
nas	B	barley (Hordeum vulgare)
ol	B	irrigated meadow
pata (or *tacal*)	B	stable for sheep, goats and cattle in the *katsa*
patwari	U	land revenue official; village accountant and record keeper, land assessor
purdah	A	literally: "curtain"; deduced: gender-segregation in two forms: 1. physical segregation of the sexes, 2. requirement for women to cover their bodies and conceal their form
qanun	A	governmental law
res	B	rotation system
register inteqalat	U	mutation book (land transactions)
resm-e-revaj	U	indigenous law
revaj-e-abpashi	U	water rights

rzing	B	water reservoir
Shigar Proper		settled area including Marapi and Markunja, also named as: Shigar oasis
tehsildar	U	revenue administrative officer
tehsil office	U	administration department
thab	B	fireplace
thabka	B	main room in the *katsa*
tro	B	wheat (Triticum aestivum)
tshar	B	garden, orchard
tsharma	B	village elder
udar	A	credit in financial terms
wa	B	furrow irrigation
zakat	A	third pillar of Islam, a voluntary tithe on property paid by a wealthy Muslim for the support of the poor
zo / zomo	B	male / female hybrid of yak and cow

List of abbreviations

AC	Assistant Commissioner
AKCSP	Aga Khan Cultural Services Programme
AKF	Aga Khan Foundation
AKRSP	Aga Khan Rural Support Programme
AKTC	Aga Khan Trust for Culture
BA	Bachelor
FA	First examination in Arts
FAO	Food and Agriculture Organization
FE	Formal Education
FFMOG	Federal Foreign Ministry of Germany
FG	Federal Government
GIS	Geographical Information System
GoP	Government of Pakistan
GPS	Global Positioning System
GST	Goods and Services Tax
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
HPP	Hydroelectric Power Plant
ICRW	International Centre for Research on Women
IUCN	International Union for the Conservation of Nature
JMT	Joint Monitoring Programme of the WHO
KKH	Karakoram Highway
LPG	Liquefied Petroleum Gas
MA	Master of Arts

MDG	Millennium Development Goal
n/a	not applicable
NAPWD	Northern Areas Public Works Department
NGO	Non-Governmental Organization
NWPD	Northern Water Power Department
PCO	Public Call Offices
PPAF	Pakistan Poverty Alleviation Fund
Rs	Rupees
SAP	Social Action Programme
SDPI	Sustainable Development Policy Institute
SIM	Subscriber Identity Module Card
STMS	Shigar Town Management Society
U.C.	Union Council
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
WAPDA	Water and Power Development Authority
WASEP	Water and Sanitation Extension Programme
WHO	World Health Organization
WPD	Water and Power Department
WSS	Water Supply System

Measurement units

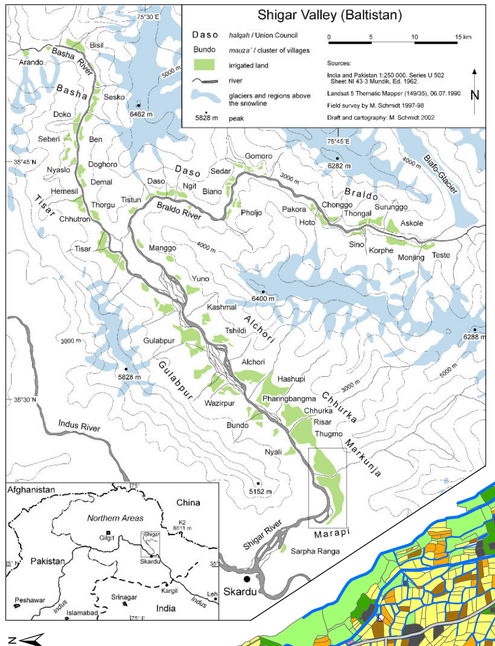
	Reference unit	**Conversion to metric system**
Units of length	1 yard	0.9144 m
	1 foot	0.3048 m
	1 inch	0.0254 m
Unit of area	1 kanal	505.86 m²
Unit of weight	1 maund	37.32 kg

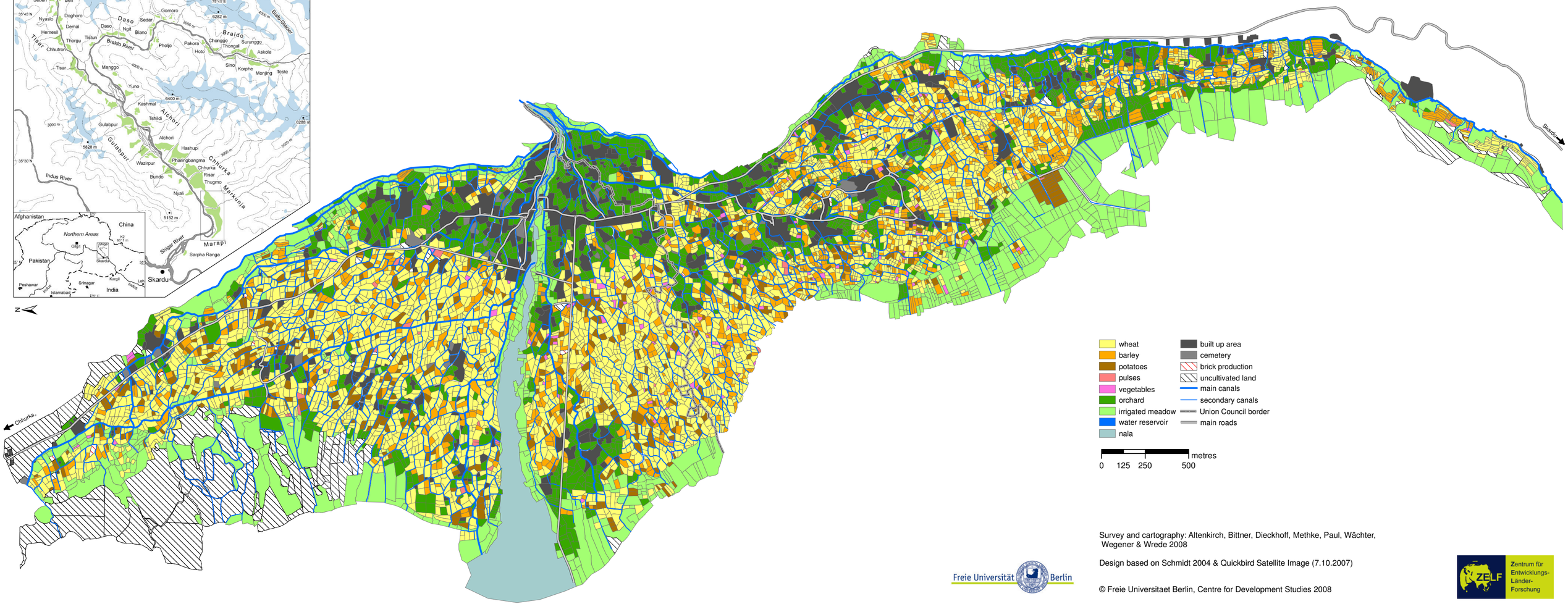
12. Annex

Annex A (see supplement)

Map 1.1 Shigar Oasis – Land Use Patterns 2008
Map 2.1 Shigar Oasis – Built Environment 2008
Map 2.2 Shigar Oasis – House Types
Map 2.3 Shigar Oasis – Functional Usage of Buildings
Map 3.1 Shigar Oasis – Road Classification
Map 3.2 Shigar Oasis – Infrastructure
Map 8.1 Utilisation of the Bazaar Area in Shigar Proper 2008

Map 1.1 Shigar Oasis – Land Use Patterns 2008





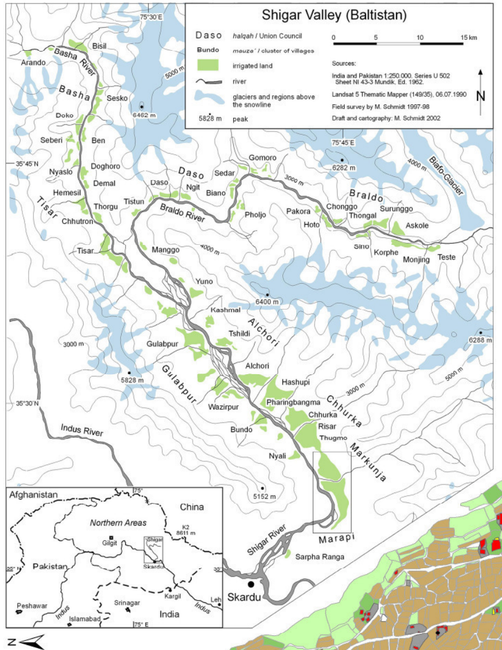
Survey and cartography: Altenkirch, Bittner, Dieckhoff, Methke, Paul, Wächter, Wegener & Wrede 2008

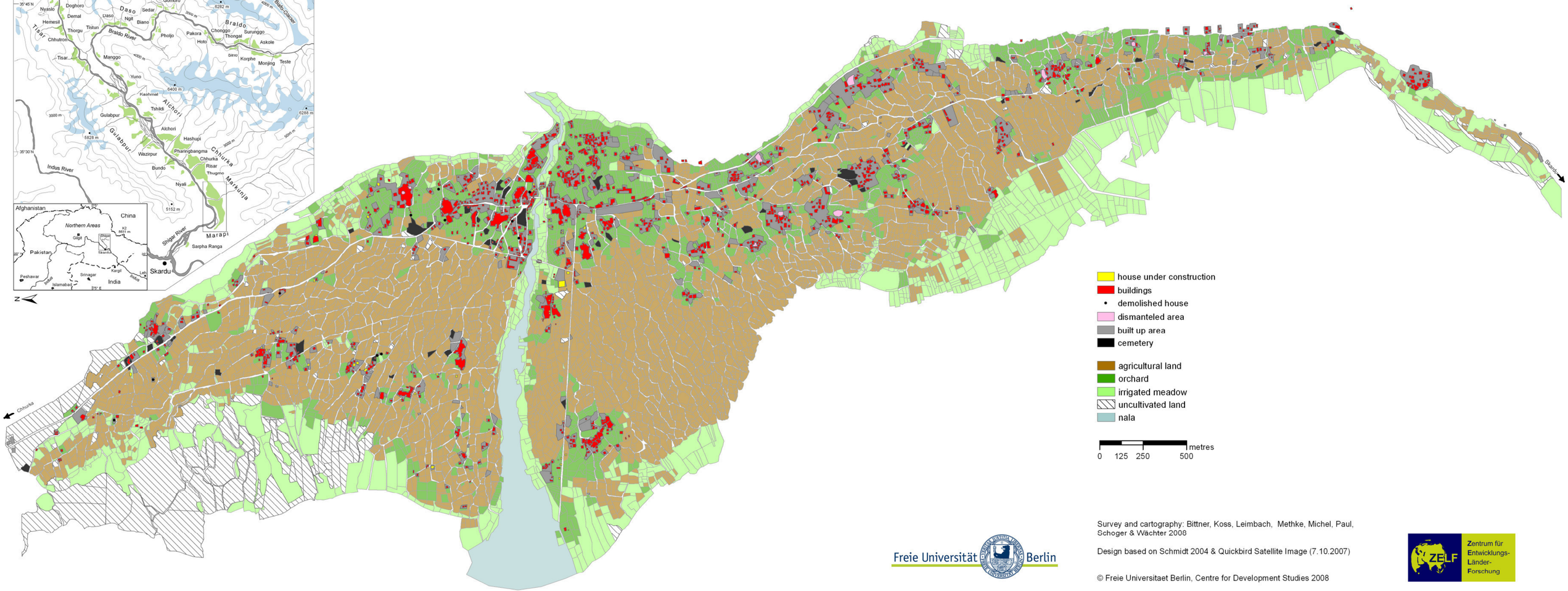
Design based on Schmidt 2004 & Quickbird Satellite Image (7.10.2007)

Freie Universität Berlin

ZELF Zentrum für Entwicklungs-Länder-Forschung

Map 2.1 Shigar Oasis - Built Environment 2008





house under construction
buildings
demolished house
dismanteled area
built up area
cemetery

agricultural land
orchard
irrigated meadow
uncultivated land
nala

0 125 250 500 metres

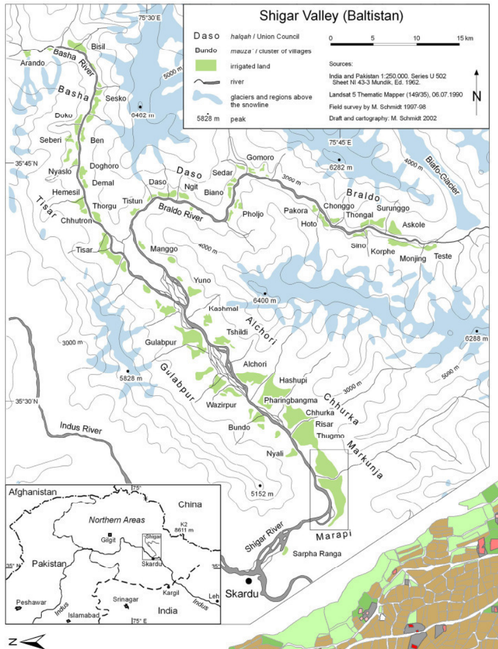
Survey and cartography: Bittner, Koss, Leimbach, Methke, Michel, Paul, Schoger & Wächter 2008

Design based on Schmidt 2004 & Quickbird Satellite Image (7.10.2007)

Freie Universität Berlin

ZELF Zentrum für Entwicklungs-Länder-Forschung

Map 2.2 Shigar Oasis - House Types



House types
- cribbage constructions
- constructions with sun dried adobes
- constructions with imported materials

- built up area
- cemetery
- agricultural land
- orchard
- irrigated meadow
- uncultivated land
- nala

0 125 250 500 metres

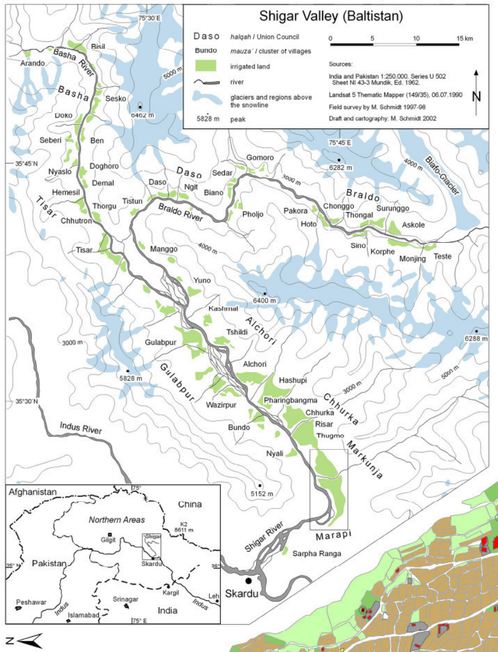
Survey and cartography: Bittner, Koss, Leimbach, Methke, Michel, Paul, Schoger & Wächter 2008

Design based on Schmidt 2004 & Quickbird Satellite Image (7.10.2007)

Freie Universität Berlin

ZELF Zentrum für Entwicklungs-Länder-Forschung

Map 2.3 Shigar Oasis - Functional Usage of Buildings



Functions of buildings

- residential building
- public building
- commercial building
- mosque
- imambara
- madrasa
- watermill

- built up area
- cemetery
- agricultural land
- orchard
- irrigated meadow
- uncultivated land
- nala

0 125 250 500 metres

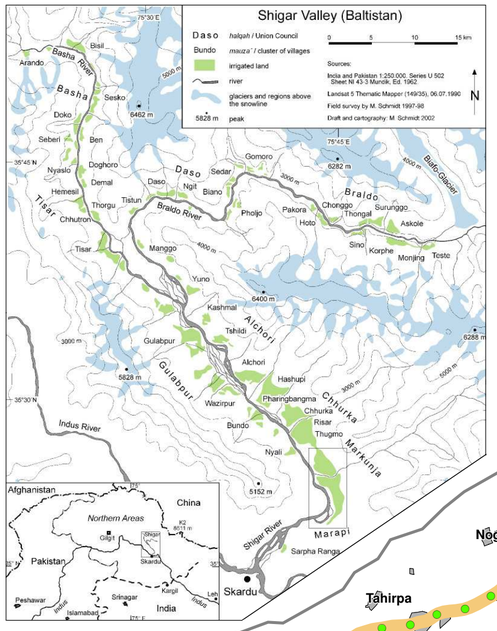
Survey and cartography: Bittner, Koss, Leimbach, Methke, Michel, Paul, Schoger & Wächter 2008

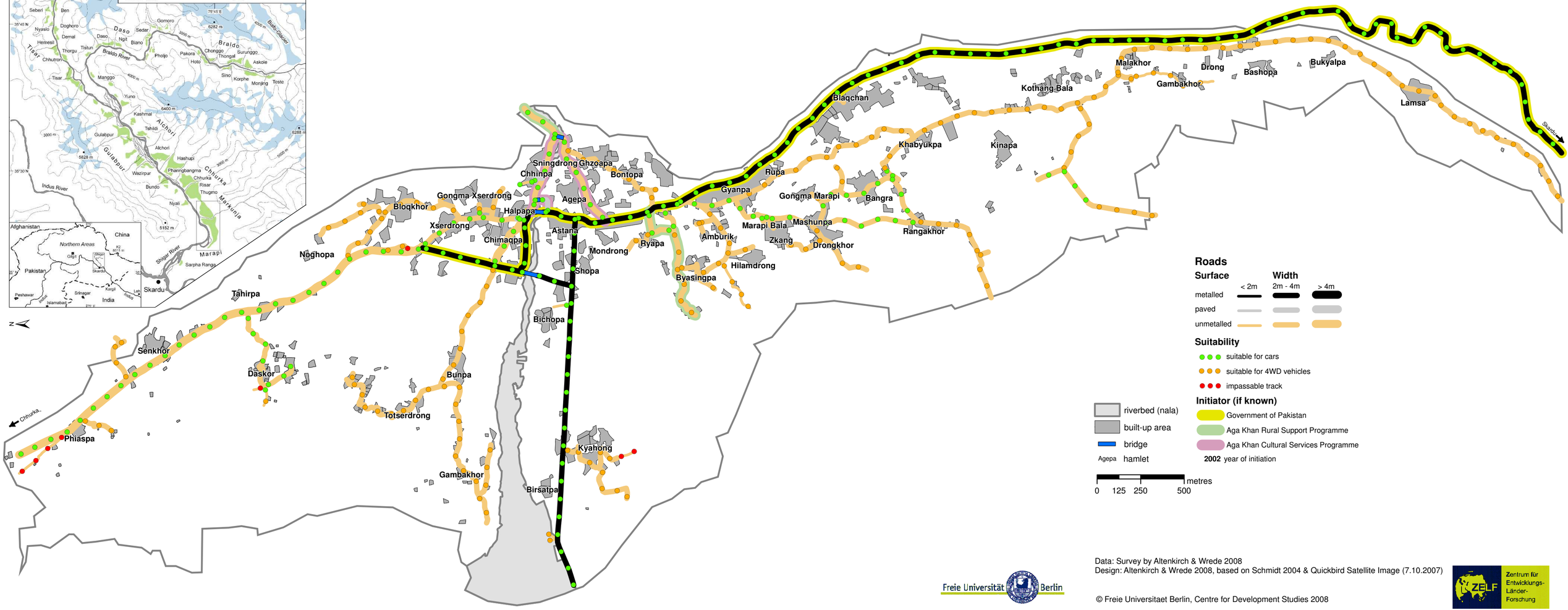
Design based on Schmidt 2004 & Quickbird Satellite Image (7.10.2007)

Freie Universität Berlin

ZELF Zentrum für Entwicklungs-Länder-Forschung

Map 3.1 Shigar Oasis - Road Classification



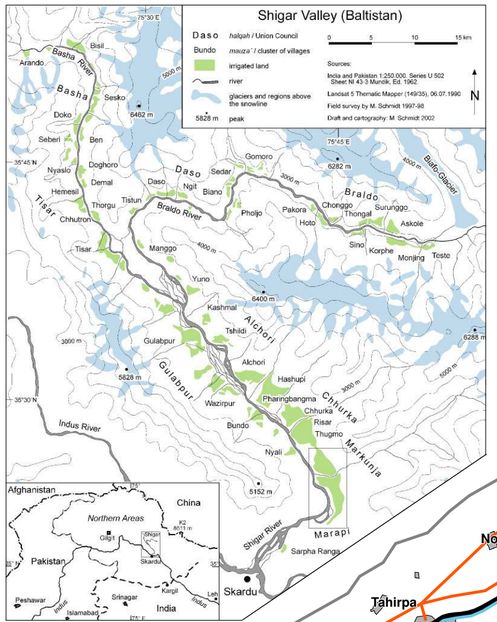


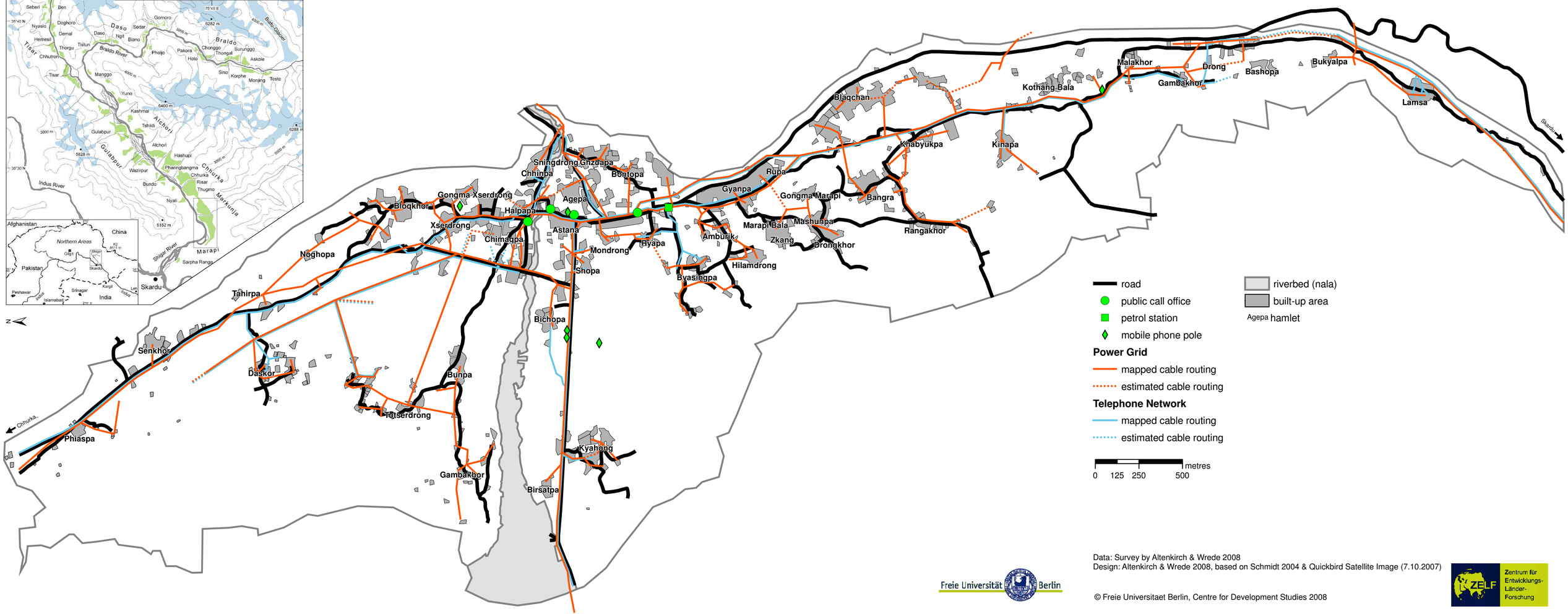
Data: Survey by Altenkirch & Wrede 2008
Design: Altenkirch & Wrede 2008, based on Schmidt 2004 & Quickbird Satellite Image (7.10.2007)

Freie Universität Berlin

ZELF Zentrum für Entwicklungs-Länder-Forschung

Map 3.2 Shigar Oasis - Infrastructure



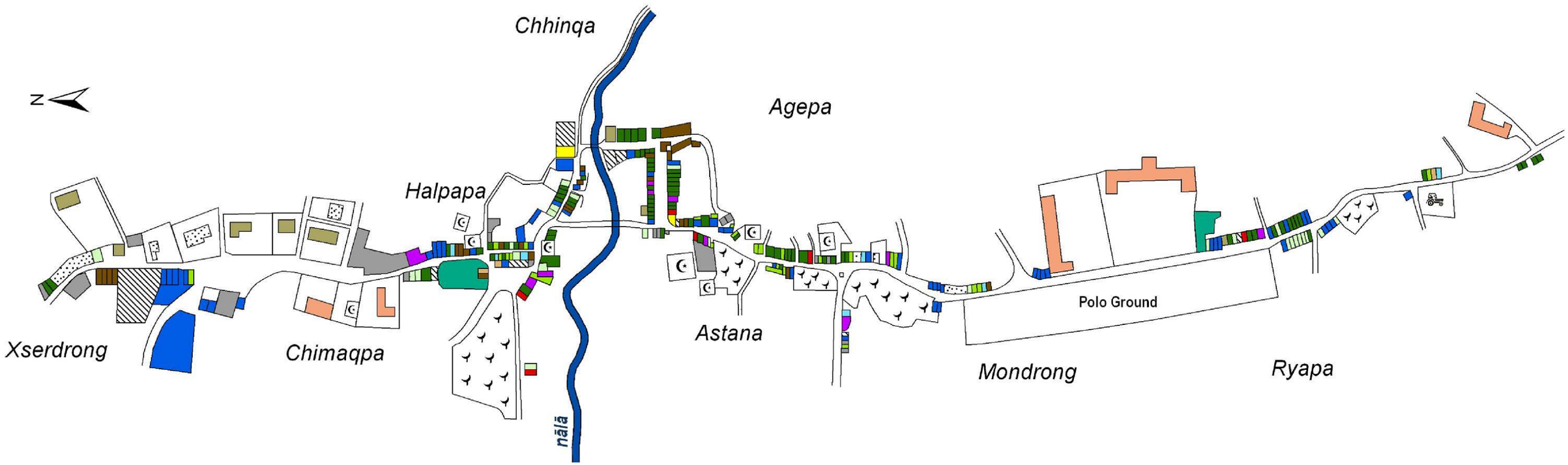


Data: Survey by Altenkirch & Wrede 2008
Design: Altenkirch & Wrede 2008, based on Schmidt 2004 & Quickbird Satellite Image (7.10.2007)

Freie Universität Berlin

ZELF Zentrum für Entwicklungs-Länder-Forschung

Map 8.1 Utilisation of the Bazaar Area in Shigar Proper 2008



- general store
- specialised retail (poultry, car spare etc.)
- wholesale (wood, marble)
- craft (carpenter´s workshop, tailoring, etc.)
- copying, writing, photo and advertising service
- gastronomy
- medical store
- bank
- mill
- storage
- school
- public institution
- residential area
- construction site
- unoccupied
- not specified
- religious institution
- cemetery
- diesel station
- *Agepa* village
- *nālā* side valley stream

0 50 100 metres

Cartography: Piel 2008
based on Quickbird Satellite Image (7.10.2007)
Survey by Hoeber, Piel, Steinert 2008

Freie Universität Berlin

ZELF Zentrum für Entwicklungs-Länder-Forschung

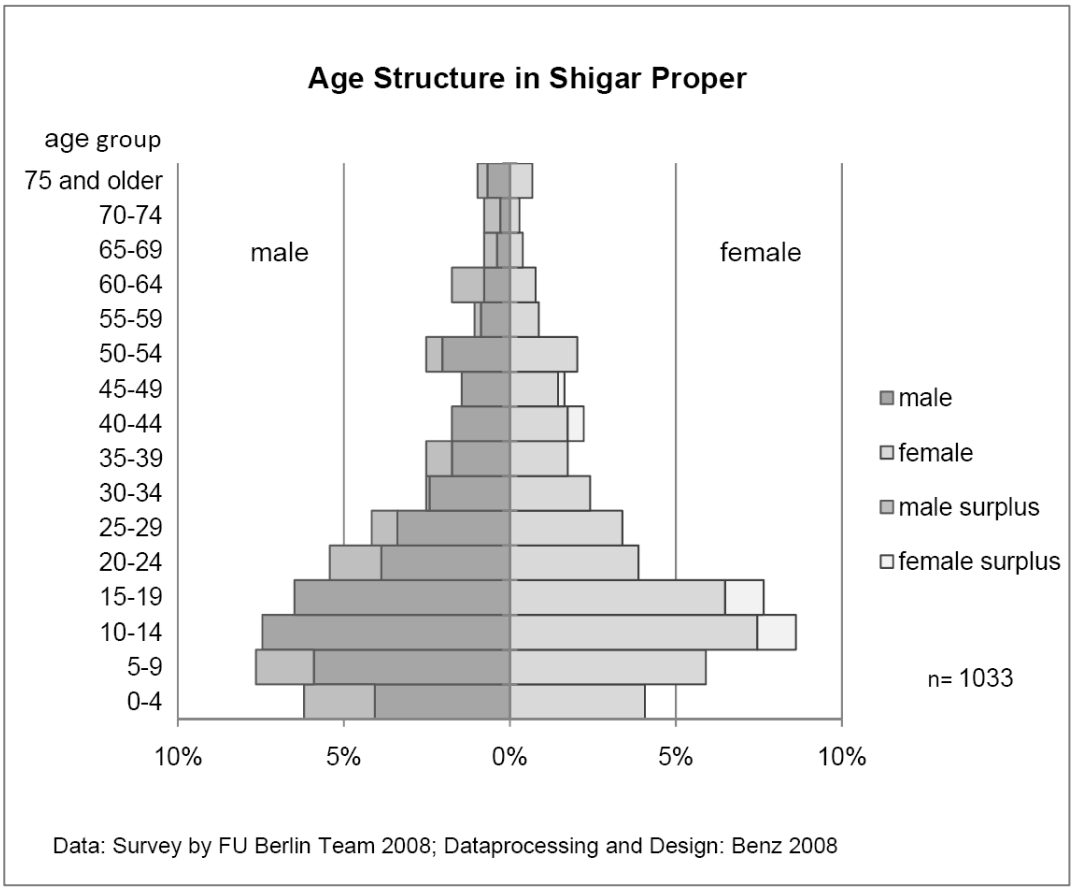
Annex B

Annex B 1 Demographic development of Shigar from 1911 to 1998

Union Council	1911[a]	1951[b]	1961[c]	1972[d]	1981[e]	1998[f]
Shigar-Valley						
Marapi	2 176	1 955	1 955	2 345	2 626	4 134
Markunja	3 225	2 850	3 042	3 573	4 020	5 429
Chhurka	2 971	2 548	2 587	2 795	2 795	4 169
Alchori	2 621	2 409	2 613	3 284	3 610	6 317
Gulabpur	3 643	3 408	3 586	4 192	4 806	7 432
Basha-Valley						
Tisar	3 127	2 918	2 887	3 152	3 456	5 440
Basha	2 605	2 403	2 461	2 797	4 133	4 401
Braldo-Valley						
Daso	2 483	2 269	2 260	2 272	2 322	3 331
Braldo	2 151	2 084	1 969	1 869	2 005	2 690
Nar						
Nar	1 254	1 292	1 363	1 459	2 021	1 979
Total	**26 256**	**24 136**	**24 723**	**27 738**	**32 364**	**45 322**

Sources: [a]DANIELLI 1994:392; [b]AFRIDI 1988:271-274. [c]MALIK 1961:Part. V:3-5. [d]GOP POPULATION CENSUS ORGANISATION 1972: 46-49. [e]GOP POPULATION CENSUS ORGANISATION 1984: 48-50. [f]GOP POPULATION CENSUS ORGANISATION 2000:2254-2257; cited according to SCHMIDT (2004a: 56).

Annex B 2 Age structure in Shigar Proper

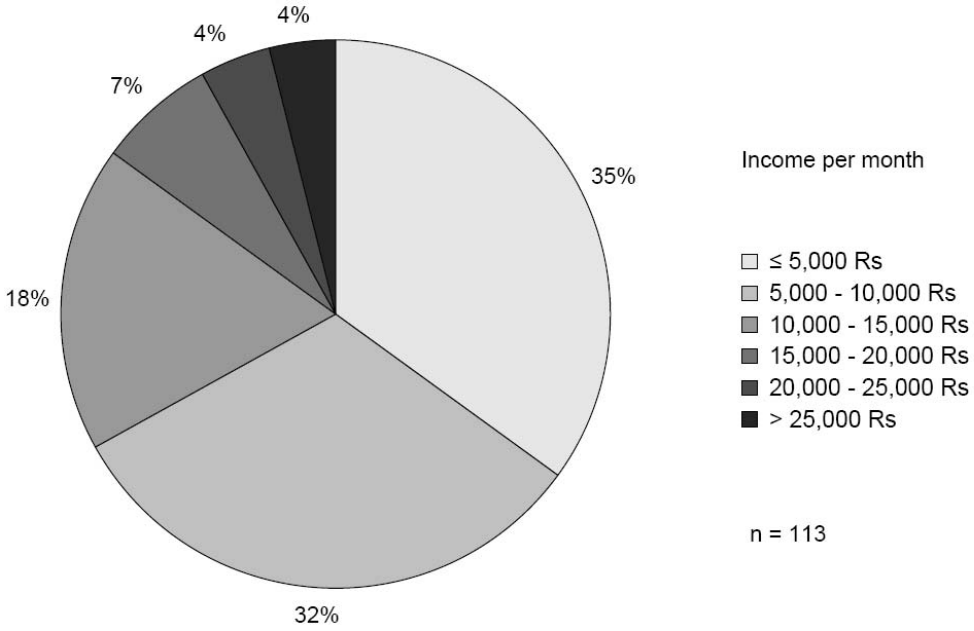


Annex B 3 Total number of households and population 2007

Hamlet	No. of households	Population
Agepa	100	923
Ghzoapa	52	469
Bontopa	62	516
Astana	22	156
Shopa	74	618
Kyahong	56	518
Chhinpa	37	283
Halpapa	39	362
Chimagpa	35	291
Xerdrong	38	306
Bloqkhor	50	407
Hasanabad	87	654
Daskor	37	358
Senkhor	34	338
Gyanpa	50	238
Blaqchan	73	645
Marapi Bala	72	496
Marapi Pain	73	533
Kothang Bala	72	555
Kothang Pain	121	942
Byasingpa	58	483
	1,242	**10,091**

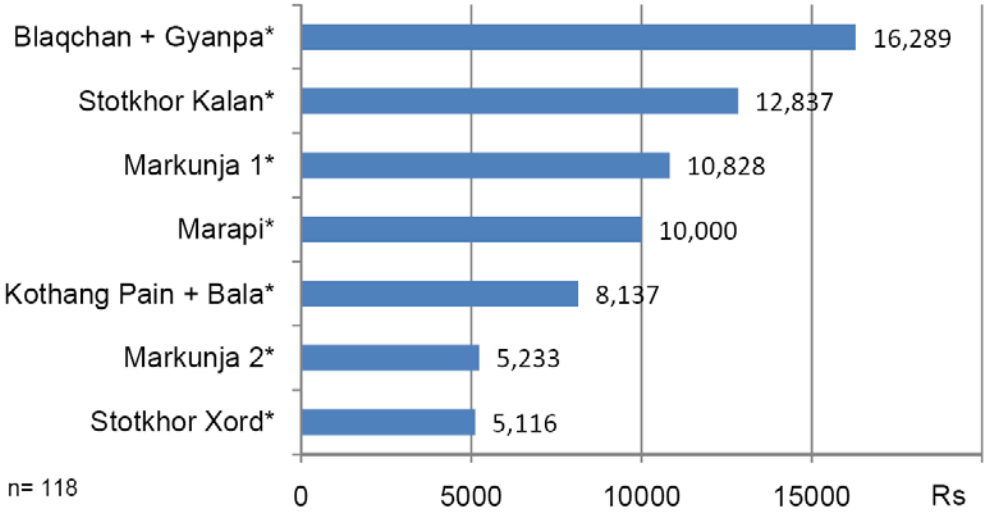
Source: IUCN: Shigar Population Survey, October 2007
(toponyms modified).

Annex B 4 Household income distribution in Shigar



Data: Survey by FU Berlin Team 2008

Annex B 5 Average income of Shigar households diversified according to hamlets



*** Blaqchan + Gyanpa:** Blaqchan, Gianpa, Rupa

Stotkhor Kalan: Manthunpa, Ryapa, Bontopa, Kyahong, Birsatpa, Mondrong, Bishopa, Shopa, Xlangokhor, Astana, Agepa

Markunja 1: Sningdrong, Chinpa, Halpapa, Chimhqpa, Xerdrong, Bloqkhor

Marapi: Kinapa, Khapyukpa, Rangakhor, Bangra, Dronkhor, Mashunpa, Zgangpa, Marapi Bala

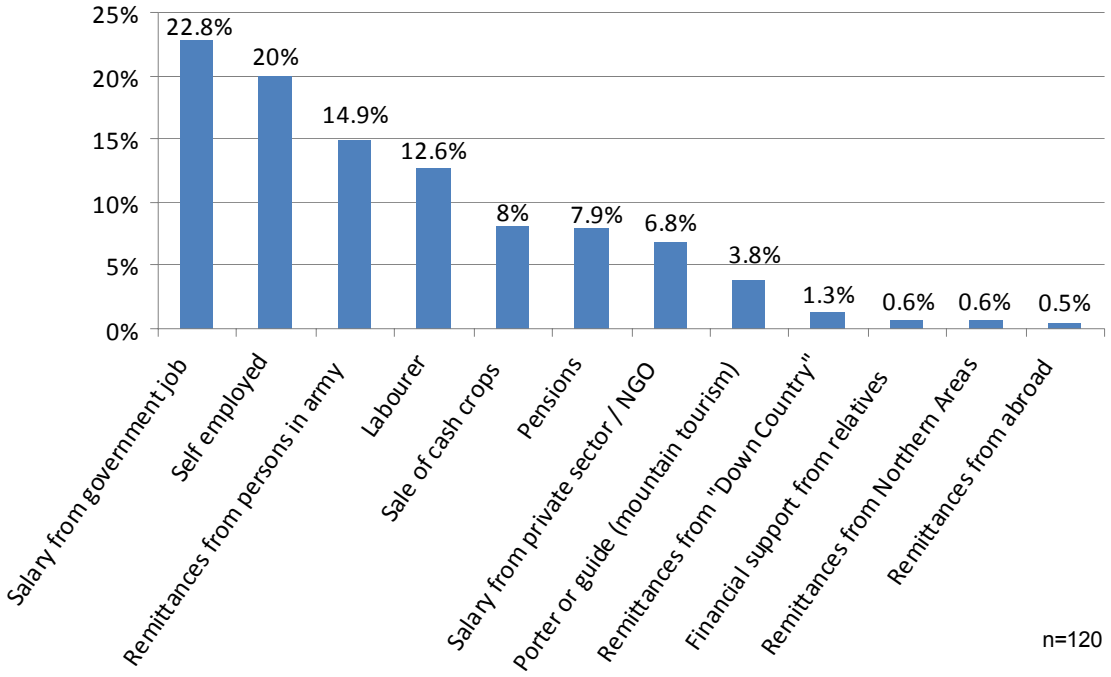
Kothang Pain + Bala: Lamsa, Bukyalpa, Bashopa, Drong, Kambakhor, Malakhor, Kotang Bala

Markunja 2: Bunpa, Totserdrong, Gambakhor-Nord, Noghopa, Tahirpa, Daskor, Senkhor, Phiaspa

Stotkhor Xord: Hilamdrong, Amburik, Dogopa, Byasingpa, Ghzoapa

Data: Survey by FU Berlin Team 2008.

Annex B 6 Composition of income in Shigar households



Data: Survey by FU Berlin Team 2008.

Annex B 7 Income composition of Shigar households

	< 5,000 Rs	5,000 – 10,000 Rs	10,000 – 15,000 Rs	15,000 – 20,000 Rs	> 20,000 Rs	no income
Salary from government job	12	15	6	1	0	85
Salary from private sector / NGO	14	5	0	0	0	1001
Self-employed	13	14	3	2	0	88
Labourer	25	7	1	0	0	87
Porter or guide	13	0	1	0	0	106
Gemstone Business	1	0	0	0	0	119
Sale of cash crops	38	4	1	0	0	77
Financial support from relatives in Shigar	4	0	0	0	0	116
Remittances from person in army	10	6	1	2	1	100
Remittances from Northern Areas	0	1	0	0	0	119
Remittances from "Down Country"	4	1	0	0	0	115
Remittances from abroad	0	1	0	0	0	119
Pensions	33	2	0	0	0	85
Data: Survey by FU Berlin Team 2008			numeral = number of households			n = 120

Annex B 8 Genderwise income contributors

Hamlet	Income contributors	
	Male	Female
Agepa	111	12
Ghzoapa	95	3
Bontopa	87	0
Astana	32	1
Shopa	95	9
Kyahong	243	247
Chhinpa	47	2
Halpapa	67	7
Chimagpa	53	2
Xerdrong	61	3
Bloqkhor	90	2
Hasanabad	114	8
Daskor	59	5
Senkhor	73	0
Gyanpa	50	3
Blaqchan	100	0
Marapi Bala	108	1
Marapi Pain	45	5
Kothang Bala	39	1
Kothang Pain	129	0
Byasingpa	67	1
	1765	**312**

Source: IUCN 2007 (toponyms modified).

Annex B 9 Governmental land (*khalisa*) in Subdivision Shigar

S. No.	Name of Area	Covered Area (*acres*)	Covered Area (*kanals*)	Name of pasture's right holders	Remarks
1.	Korosthang Sarfaranga	493	3946	Sarfaranga/ Olding Skardu	
2.	Saythang	1348	10783	1. Olding Skardu 2. Hussainabad 3. Thgorgo 4. Sarfaranga 5. Kothang Pain 6. Kothang Bala 7. Braqchan 8. Marapi 9. Gianpa Roopi 10. Totkhur Khurd 11. Totkhur Kalan 12. Nar	
3.	Kuoqthang	500	4000	1. Marapi 2. Gianpa Roopi	
4.	Sarfothang	234	1875	Totkhur Kalan	200 Kanals allotted to Inter College Shigar
5.	Hayadas	1000	8000	Alchori	
6.	Ghorocho	2220	17760	1. Tissar 2. Thorgo 3. Soqgo Gulabpur 4. Tiston 5. Mango	
	Total	5795	46360		

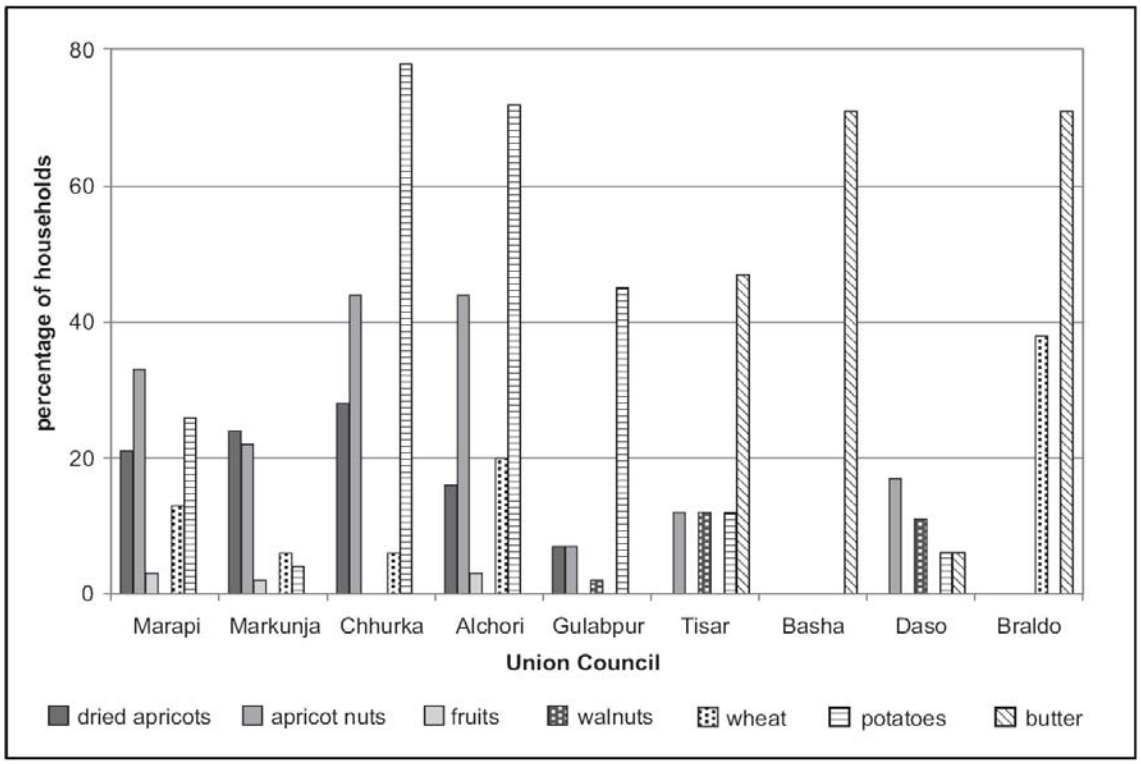
Source: Unpublished Information Sheet by Assistant Commissioner Shigar, 2008.

Annex B 10 Land holdings in Shigar

Muhalla	Size of land holdings		
	Agricultural land (*kanal*)	Non-agricultural land (*kanal*)	Total residentisl area (*kanal*)
Agepa	761	1665	83.3
Ghzoapa	1378	1024	51.2
Bontopa	558	537	26.9
Astana	55.5	51	2.6
Shopa	553.5	322.8	16.13
Kyahong	742	252	12.6
Chhinpa	316	209	10.5
Halpapa	644.5	349	17.5
Chimagpa	369	162	8.1
Xerdrong	499	209	10.5
Bloqkhor	520.5	281.3	14.1
Hasanabad	895	248	12.4
Daskor	437	633	31.7
Senkhor	571	215	10.8
Gyanpa	637.5	714	35.7
Blaqchan	535	174	8.7
Marapi Bala	585	260	13
Marapi Pain	385	185.5	9.3
Kothang Bala	439	404	20.2
Kothang Pain	881	460	23
Byasingpa	380	145.3	7.3
	12,142.5	**8,500.8**	**425.0**

Source: IUCN 2007 (orthography of toponyms modified).

Annex B 11 Selling of agricultural products in Shigar



Source: SCHMIDT (2004a: 244)

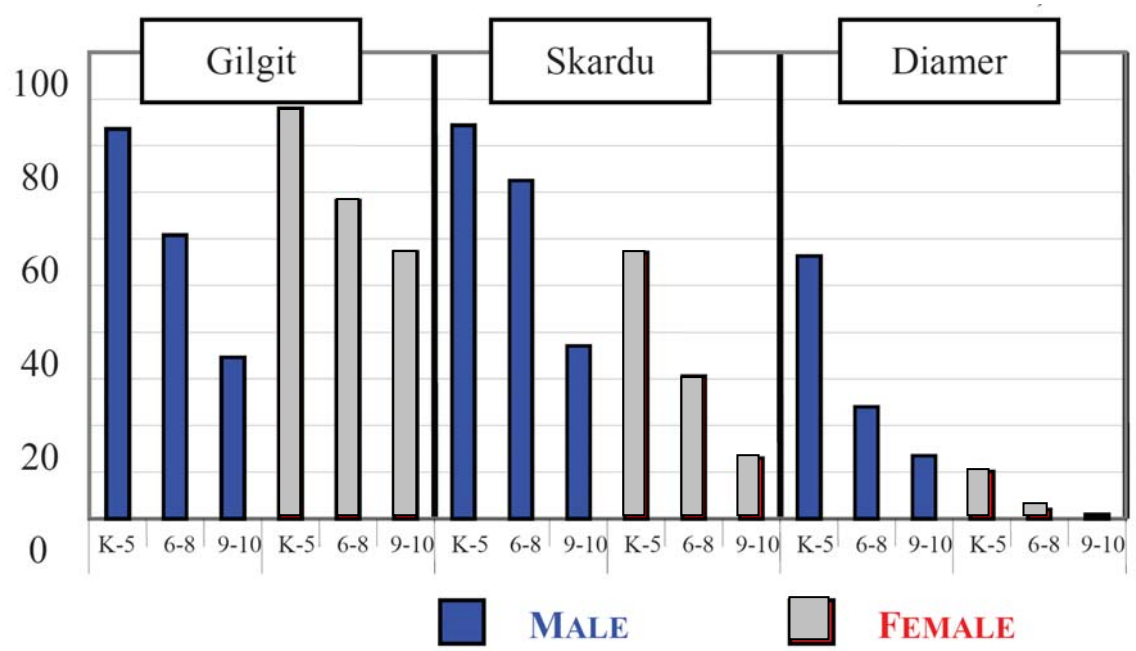
Annex B 12 Telephone availability in Shigar hamlets

Hamlets	No. of interviewed households	No. of available landline phones	No. of available mobile phones	Landline phone %	Mobile phone %
Kothang[1]	20	3	12	15%	60%
Marapi[2]	14	1	3	7.1%	21.4%
Blaqchan+Gyanpa[3]	12	6	8	50%	66.7%
Stotkhor Xord[4]	12	2	7	16.7%	58.3%
Stotkhor Kalan[5]	29	8	16	27.6%	55.2%
Markunja I [6]	21	5	17	23.8%	81%
Markunja II [7]	15	2	9	13.3%	60%
	123	**27**	**72**		

[1] Lamsa, Bukyalpa, Bashopa, Drong, Kambakhor, Malakhor, Kotang Bala
[2] Kinapa, Khapyukpa, Rangakhor, Bangra, Dronkhor, Mashunpa, Zgangpa, Marapi Bala
[3] Blaqchan, Gianpa, Rupa
[4] Hilamdrong, Amburik, Dogopa, Byasingpa, Ghzoapa
[5] Manthunpa, Ryapa, Bontopa, Kyahong, Birsatpa, Mondrong, Bishopa, Shopa, Xlangokhor, Astana, Agepa
[6] Sningdrong, Chinpa, Halpapa, Chimhqpa, Xerdrong, Bloqkhor
[7] Bunpa, Totserdrong, Gambakhor-Nord, Noghopa, Tahirpa, Daskor, Senkhor, Phiaspa

Data: Survey by FU Berlin Team 2008

Annex B 13 Gross enrolment ratios in selected districts of northern Pakistan. 2005



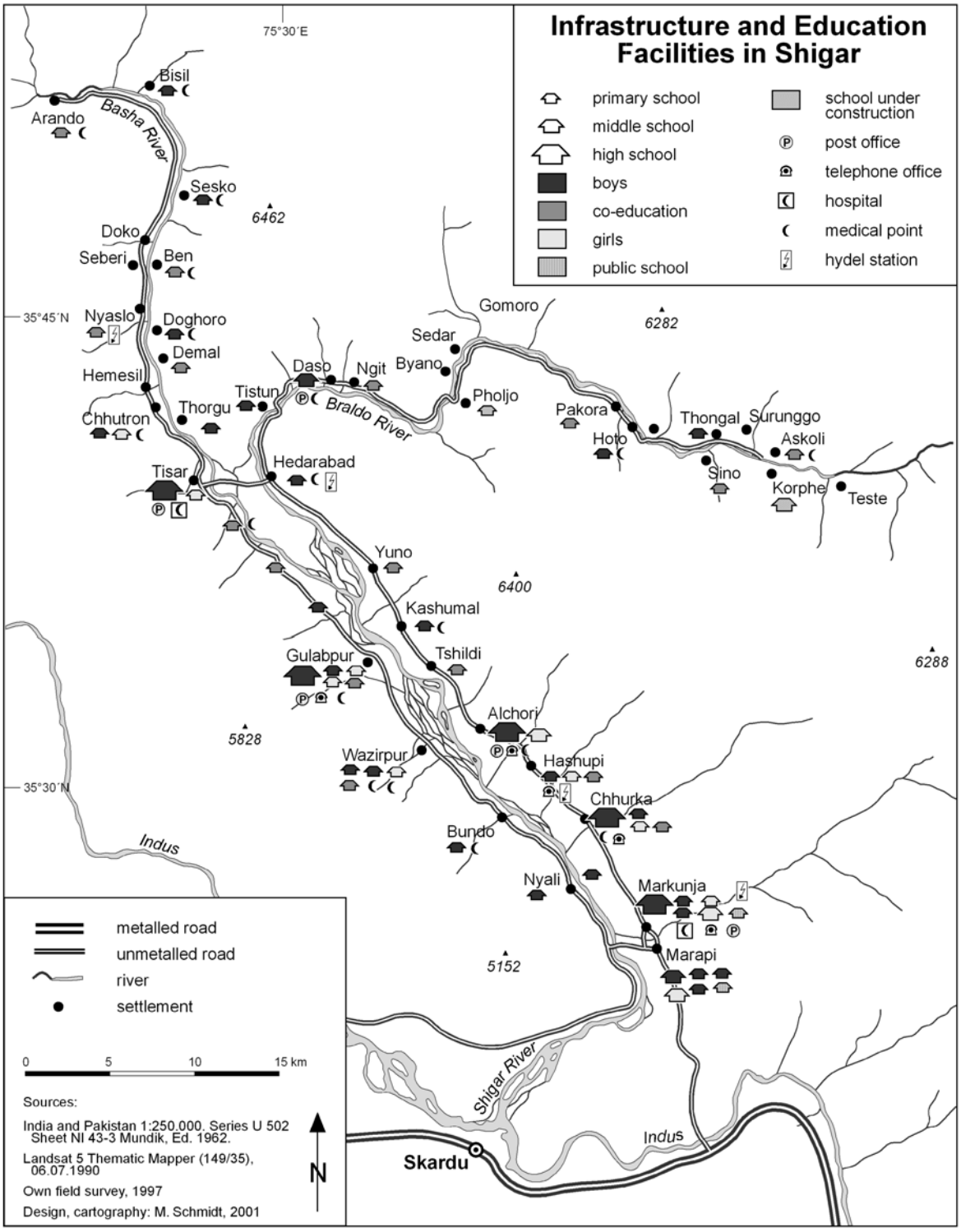
Source: AKF (2007:3)

Annex B 14 Student enrolment across all types of schools, Northern Areas, 2005

Level	Gender	Government	SAP Community	AKES	Other Private	Total
Primary	Boys	45,259	16,673	7,304	19,973	**89,209**
	Girls	26,744	21,649	9,913	8,004	**66,310**
Middle	Boys	16,084	32	2,138	5,457	**23,711**
	Girls	7,963	586	4,951	1,909	**15,409**
High	Boys	5,933	1	212	1,509	**7,655**
	Girls	2,775	69	2,777	768	**6,389**
Total	Boys	67,276	16,706	9,654	26,939	**120,575**
	Girls	37,482	22,304	17,641	10,681	**88,108**
Overall Enrolment		**50%**	**19%**	**13%**	**18%**	**100%**

Source: AKF (2007:2) (modified)

Annex B 15 Infrastructure and education facilities in Shigar



Source: Schmidt (2004a:56)

Occasional Papers Geographie:

Heft 11: GAD, G. (2001): Die Bedeutung von Unternehmensethik im Entscheidungs- und Handlungsprozeß transnationaler Unternehmer in Entwicklungsländern

Heft 12: SCHOLZ, F. et al. (2001): Lebenswirklichkeit in einem „globalisierten Ort". Das Beispiel Dhaka, Hauptstadt von Bangladesh. Eine sozialgeographische Skizze

Heft 13: HILLMANN, F. (2002): Positionierung und Bedeutung ethnischer Arbeitsmärkte

Heft 14: GAD, G. (2002): Public Private Partnership (PPP) in der Entwicklungszusammenarbeit

Heft 15: WEGNER, A. (2002): Entwicklungshilfe durch Informationstechnologie. Ägyptens Kleinunternehmer proben E-Commerce im Cyberbazaar

Heft 16: ODIJK, S. van, S. OEHM, J. SCHÜTZE (2002): Berlin — Bahnhof Zoologischer Garten. Gibt es im Zuge von Globalisierung eine Verdrängung von Armutsbevölkerung aus (ehemals) öffentlichem Raum?

Heft 17: KROIS, J., T. TARASCHEWSKI, E. TROSCHKE (2003): Standardisierung und Internationalisierung des Waren- und Dienstleistungsangebots als Folge von Globalisierungsprozessen am Beispiel Berlins

Heft 18: DROWSKI, R., M. MEYER (2003): Förderung von Forschungs- und Entwicklungseinrichtungen in Berlin unter Berücksichtigung der Anforderungen der Globalisierung

Heft 19: FEUCHTE, B. (2003): Der Ansatz der „Transnationalen sozialen Räume" zur Erklärung von Migrationprozessen

Heft 20: SCHÜTT, B. (ed.) (2004): Watershed management in the Abaya - Chamo basin, South Ethiopia

Heft 21: SCHOLZ-ZIEGELBAUER, H. (Hrsg.) (2004): Geographische Skizzen

Heft 22: SCHENKEL, K. (2004): Kulturelle Selbstwahrnehmung jugendlicher Berliner Türkinnen

Heft 23: NEUDERT, E. (2004): »Housing poverty« und weibliche Armut in Städten der »Dritten Welt« am Beispiel eines Railwayslums in Bombay

Heft 24: SCHOLZ, F. (2004): Globalisierung. Geographische Forschungsbeiträge.

Heft 25: MUELLER, B. (2004): Dörfer im Transformationsprozess Kirgistans. Tasma und Toru Aigyr im Biosphärenreservat Issyk-Kul

Heft 26: RYLL, M., A. SCHUBERT (2004): Street Art und die Wechselwirkungen von Mensch und Raum in FriedrichshainKreuzberg

Heft 27: FUHR, L., R. SPRENGER (2004): Indische IT-Fachkräfte zwischen Bangalore und Berlin. Aktive Gestalter oder passive Mitläufer im Globalisierungsprozess

Heft 28: FRAYER, J. und J. MIRETE (2005): Landreformen in China. Eine Erfolgsgeschichte der Modernisierung?

Heft 29: GAD, G. (2005): „Vom Plan zum Markt". Reformen bei der mobilen Tierhaltung auf dem Tibetischen Hochplateau in der V. R. China

Heft 30: BORCHERS, K. et al (2004): Globalisierung in Südindien - Keralas Bauern zwischen Weltmarkt und Subsistenz. Ein Beitrag zur qualitativ-sozialgeographischen Entwicklungsforschung

Heft 31: STUMPTNER, A., UNKRIG, A., ZENS, M. (2005): Globale Herausforderungen, lokale Akteure. Berliner Grundschulen im Spiegel neuer gesellschaftlicher Fragmentierungstendenzen

Heft 32: SCHMIDT, M. (2006): Transformation der *Livelihood Strategies* im ländlichen Kirgistan. Verlorene Sicherheiten und neue Herausforderungen

Heft 33: MAIER, C. (2007): Decentralised Rural Electrification by Means of Collective Action - The Sustainability of Community Managed Micro Hydels in Chitral, Pakistan

Heft 34: BLANK, M. (2007): Rückkehr zur subsistenzorientierten Viehhaltung als Existenzsicherungsstrategie - Hochweidewirtschaft in Südkirgistan