

**BONNER GEOGRAPHISCHE ABHANDLUNGEN**

Heft 118

ISSN 0373-0468

FAZLUR-RAHMAN

**Persistence and Transformation  
in the Eastern Hindu Kush:**

**A Study of Resource Management Systems  
in Mehlp Valley, Chitral, North Pakistan**

Herausgeber • Editor:  
Geographisches Institut der Universität Bonn  
*Department of Geography, University of Bonn*

Schriftleitung • *Editor-in-chief* W. Schenk



ASGARD-VERLAG SANKT AUGUSTIN 2007

**Persistence and Transformation in the Eastern Hindu Kush:  
A Study of Resource Management Systems  
in Mehlp Valley, Chitral, North Pakistan**

**BONNER GEOGRAPHISCHE ABHANDLUNGEN**

**Heft 118**

ISSN 0373-0468

FAZLUR-RAHMAN

**Persistence and Transformation  
in the Eastern Hindu Kush:  
A Study of Resource Management Systems  
in Mehlp Valley, Chitral, North Pakistan**

Herausgeber · *Editor*

Geographisches Institut der Universität Bonn  
*Department of Geography, University of Bonn*

Schriftleitung · *Editor-in-chief* W. Schenk



ASGARD-VERLAG SANKT AUGUSTIN 2007

**Persistence and Transformation  
in the Eastern Hindu Kush:  
A Study of Resource Management Systems  
in Mehlp Valley, Chitral, North Pakistan**

von · *by*

FAZLUR-RAHMAN

mit 30 Abbildungen, 30 Tabellen und 7 Karten, davon 4 auf einer Farbbeilage  
*with 30 figures, 30 tables and 7 maps, of which 4 are on one colour supplement*

In Kommission bei · *on consignment by* Asgard-Verlag, Sankt Augustin

Asgard-Verlag · Sankt Augustin

**alle Rechte vorbehalten**  
*all rights reserved*

**ISBN: 978-3-537-87668-3**

**© 2007 Asgard-Verlag Dr. Werner Hippe GmbH, 53757 Sankt Augustin**  
**Herstellung · Production Druckerei Martin Roesberg, 53347 Alfter-Impekoven**  
**Umschlag · Cover G. Storbeck**

## **Foreword**

Printing this volume was supported by the help of quite a number of projects and institutions, especially by means of the Afghanistan-Project of the Department of Geography of the University of Bonn (supervisor: PD Dr. Andreas Dittmann) and by the Karakorum-Project of the Department of Geography of the University of Bonn (supervisor: Prof. Dr. Matthias Winiger). The author would like to thank all those who contributed to the final realization of this volume.

# Contents

|  |           |
|--|-----------|
| Foreword   | I         |
| Table of Contents  | II        |
| List of Figures  | VII       |
| List of Tables   | VIII      |
| List of Maps   | VIII      |
| <b>1 Conceptual and Methodological Framework</b>                               | <b>1</b>  |
| 1.1 Introduction   | 1         |
| 1.2 Objectives and Central Questions of the Research                           | 7         |
| 1.3 Status of Research and Sources of Information on the Research Area         | 11        |
| 1.4 Research Methodology and Data Collection Procedures                        | 13        |
| 1.4.1 Self-Administered Questionnaire Survey and Group Interviews              | 13        |
| 1.4.2 Mapping Procedure: Use of Remotely Sensed Data and Application of GIS    | 14        |
| 1.4.3 Archives Research in India Office Library London                         | 16        |
| 1.5 Composition of the Thesis  | 16        |
| <b>2 Physical and Anthropogenic Characteristics of the Research Area</b>       | <b>18</b> |
| 2.1 Ecological Characteristics and Physical Resource Potential of Mehlp Valley | 18        |
| 2.1.1 Location and Topographical Features                                      | 18        |
| 2.1.2 Climatic Characteristics   | 21        |
| 2.1.3 Natural Vegetation Cover   | 24        |
| 2.2 Historical and Political Characteristics                                   | 25        |
| 2.2.1 Traditional System of Political Organisation                             | 25        |
| 2.2.2 Feudalism: The Mehtar Period up until 1895                               | 26        |
| 2.2.3 Colonial Period and Indirect Rule 1895-1947                              | 29        |
| 2.2.4 Independence and Transitional Period 1947-1969                           | 32        |
| 2.2.5 Modern Period from 1969 Onwards  | 33        |
| 2.3 Demographic Dynamics and Social Characteristics                            | 36        |
| 2.3.1 Population Growth in Chitral District since 1899                         | 36        |
| 2.3.2 Social Stratification, State Duties and Distribution of Social Groups    | 40        |
| 2.3.3 Permanent Out-Migration from Mehlp Valley                                | 44        |
| 2.4 Resource Base, Political Evolution and Population Pressure: Summary        | 45        |

|          |  |            |
|----------|--|------------|
| <b>3</b> | <b>Resources: Ownership, Utilisation and Management Mechanisms</b>                   | <b>47</b>  |
| 3.1      | A Classification of Property Regimes   | 47         |
| 3.2      | Land in Private Property or Individual Ownership                                     | 50         |
| 3.2.1    | Location of the Arable Land at Different Altitudinal Levels                          | 51         |
| 3.2.2    | Land Tenure System in the Historical Context   | 52         |
| 3.2.3    | Local Tenancy System and Traditional Responsibilities of the Tenants                 | 54         |
| 3.2.4    | Customary Laws for the Alienation of Arable Land                                     | 56         |
| 3.2.5    | Intra-Village Disparities in Land Ownership/Occupancy                                | 60         |
| 3.2.5.1  | Distribution of Fields and Field Size  | 63         |
| 3.2.5.2  | Farm Size as an Indicator of Disparity in Land Ownership/Occupancy                   | 64         |
| 3.2.6    | Utilisation of the Arable Land   | 65         |
| 3.3      | Summary: Ownership and Utilisation of Arable Land                                    | 81         |
| 3.4      | Common Property  | 82         |
| 3.4.1    | Common Property Systems in Mehlp Valley  | 82         |
| 3.4.2    | Access, Withdrawal Rights and Appropriation of Resource Units                        | 84         |
| 3.4.3    | Land in Clan Ownership   | 85         |
| 3.4.3.1  | Grazing Land in the Vicinity of the Arable Land                                      | 85         |
| 3.4.3.2  | Clan Level Distribution and Management of <i>Prangos pabularia</i> ( <i>Moshin</i> ) | 87         |
| 3.4.4    | User Groups as Resource Owners   | 98         |
| 3.4.4.1  | Pastures and Pasture Resources   | 99         |
| 3.4.4.2  | Irrigation Water: Allocation and Related Responsibilities                            | 104        |
| 3.4.5    | Land in Village Ownership  | 114        |
| 3.4.6    | Inter-Village Pasture Utilisation Rights   | 118        |
| 3.4.6.1  | Controlled Sheep and Goats Grazing   | 118        |
| 3.4.6.2  | Seasonal Free Grazing of Cattle  | 120        |
| 3.5      | Summary: Resource Ownership and Management Mechanisms                                | 122        |
| <b>4</b> | <b>Traditional Livelihood Systems and Collective Sustenance Strategies</b>           | <b>124</b> |
| 4.1      | Introductory Remarks on Creative Adjustments   | 124        |
| 4.2      | The Agricultural Calendar and Related Activities                                     | 125        |
| 4.2.1    | Village Chronometer and Traditional Measures for Accelerating Snowmelt               | 126        |
| 4.2.1.1  | Ploughing Equipments/Techniques and Sowing of Barley                                 | 127        |



|         |   |     |
|---------|---|-----|
| 4.2.1.2 | Firewood Collection, Irrigation and Sowing of Spring-Season Crops       | 128 |
| 4.2.1.3 | Spring Season Milling and Extensive Afforestation Activities            | 130 |
| 4.2.2   | Summer Season: Repair and Construction of Settlement Ensembles          | 131 |
| 4.2.2.1 | Techniques and Organisation of Crop and Grass Harvest                   | 131 |
| 4.2.2.2 | Repair of Threshing Floors and other Threshing Arrangements             | 134 |
| 4.2.3   | Declining Agricultural Workload and end of the Cropping Season          | 137 |
| 4.2.3.1 | Sowing of Winter Wheat and Milling of Grain                             | 137 |
| 4.2.4   | Limited Outdoor Activities and More Time for Domestic Handicrafts       | 138 |
| 4.3     | Economic Significance and Salient Features of Animal Husbandry          | 140 |
| 4.3.1   | Herd Size and Composition   | 141 |
| 4.3.2   | Organisation of Animal Husbandry in Space and Time                      | 144 |
| 4.3.2.1 | Cattle and Milk Cow Grazing in the Vicinity of the Dwellings            | 145 |
| 4.3.2.2 | Turn-Based Goats Grazing Arrangements ( <i>Sotsiri</i> )                | 147 |
| 4.3.2.3 | Collective and Individual Arrangements for Sheep Grazing                | 149 |
| 4.3.2.4 | Seasonal Tending of Others' Animals as a Barter arrangement             | 150 |
| 4.3.2.5 | Rules regarding Rotational-based Turn Grazing                           | 151 |
| 4.3.2.6 | Yak Grazing Arrangements during the Winter Season                       | 152 |
| 4.3.2.7 | Problems and Constraints of Poultry Keeping                             | 154 |
| 4.3.2.8 | Organisation and Allocation of Fodder for Winterfeeding of Livestock    | 154 |
| 4.3.3   | Animal Products as Sources of Energy and Material for Local Handicrafts | 156 |
| 4.3.3.1 | Processing and Use of Meat, Milk and its Derivatives                    | 157 |
| 4.3.3.2 | Wool Processing: Making Products for Self Use, Exchange and Sale        | 158 |
| 4.3.3.3 | Hair Processing and Making of Coarse Rugs and Ropes                     | 163 |
| 4.3.3.4 | Seasonally Fluctuating Prices of Livestock                              | 165 |
| 4.3.4   | Socio-Cultural Dimensions of Animal Husbandry                           | 166 |
| 4.3.4.1 | Exchange of Livestock in the Village                                    | 166 |
| 4.3.4.2 | Breed Improvement Methods and Seasonal Borrowing of Milk Cows           | 167 |
| 4.4     | Off-Farm Sources of Income and Sale of Domestic Handicrafts             | 168 |
| 4.5     | Seasonal Movement Within the Village                                    | 169 |
| 4.5.1   | Collective Occupation of Summer Settlements                             | 171 |
| 4.5.2   | Movement during the Winter Season                                       | 173 |
| 4.6     | Levels of Cooperation and Reciprocities                                 | 174 |
| 4.6.1   | Organisation and Exchange of Labour at Various Levels                   | 175 |

|          |   |            |
|----------|---|------------|
| 4.6.2    | Gender Division of Labour at Household Level                        | 178        |
| 4.6.3    | Cooperation at Neighbourhood Level                                  | 181        |
| 4.6.3.1  | Social and Economic Cooperation                                     | 181        |
| 4.6.3.2  | Mosque Management Systems   | 182        |
| 4.6.4    | Cooperation at Clans' Level   | 183        |
| 4.6.4.1  | Watermill Management, Operation and Maintenance                     | 184        |
| 4.6.5    | Cooperation at Village Level  | 185        |
| 4.6.5.1  | Burial System in the Village and Responsibilities of the Clans      | 185        |
| 4.6.5.2  | Bringing a new Watermill-Stone from the Pasture                     | 187        |
| 4.6.5.3  | House Construction as a Cooperative Work                            | 187        |
| 4.7      | Village Artisans, their Services and Traditional Payment System     | 188        |
| 4.7.1    | Village Blacksmiths and Responsibilities of their Clients           | 189        |
| 4.7.2    | Duties of the Musicians ( <i>dom</i> )                              | 190        |
| 4.8      | Summary   | 191        |
| <b>5</b> | <b>Recent Changes and their Impacts on the Village</b>              | <b>193</b> |
| 5.1      | Overview of the Driving Forces                                      | 193        |
| 5.2      | Changes in Agriculture  | 196        |
| 5.2.1    | Changes in the Arable Land Ownership                                | 198        |
| 5.2.2    | Changes in Crop Rotation and Cropping Pattern                       | 200        |
| 5.2.3    | Modern Agricultural Innovations                                     | 201        |
| 5.2.4    | Heavy Dependence on Exogenous Food Supplies                         | 203        |
| 5.3      | Changes in Animal Husbandry   | 207        |
| 5.3.1    | Changes in Livestock Ownership                                      | 208        |
| 5.3.2    | New Grazing Arrangements for Sheep and Goats                        | 210        |
| 5.4      | Changes in House Design and Construction                            | 211        |
| 5.5      | Transformation of the Village Economy                               | 215        |
| 5.5.1    | Limited Opportunities for Off-Farm Income Sources                   | 217        |
| 5.5.2    | Changing Trends and Patterns of Male Out-Migration                  | 217        |
| 5.5.2.1  | Employed Migrants: Source of Cash and Helpers in Farming Activities | 218        |
| 5.5.2.2  | Seasonal Wage-Labour Migrants ( <i>Muzduri</i> )                    | 220        |
| 5.5.2.3  | Increasing Numbers and New Trends in International Migration        | 221        |
| 5.5.2.4  | Educational Migration and New Trends in Informal Education          | 224        |

|          |  |            |
|----------|--|------------|
| 5.6      | Non-Governmental Organisations and Response from the Community         | 226        |
| 5.6.1    | Village Organisations and Projects Completed                           | 228        |
| 5.6.2    | Current Situation and Future of AKRSP-Initiated Development Activities | 230        |
| 5.7      | Maintenance of Newly Constructed Infrastructures                       | 231        |
| 5.7.1    | Maintenance of Jeepable Roads  | 231        |
| 5.7.2    | Micro-Hydroelectricity and its Operation and Maintenance               | 234        |
| 5.7.3    | Maintenance of the Sale-point and Dealing with Concerned Officials     | 235        |
| 5.8      | Impacts on the Functioning of the Traditional Society                  | 236        |
| 5.9      | Summary: The Integration of Innovations into the Traditional System    | 238        |
| <b>6</b> | <b>Transformation and Sustainability in the Eastern Hindu Kush</b>     | <b>240</b> |
| <b>7</b> | <b>References</b>  | <b>254</b> |
| <b>8</b> | <b>List of Abbreviations</b>   | <b>287</b> |
| <b>9</b> | <b>Appendix</b>  | <b>289</b> |

## List of Figures

|           |   |     |
|-----------|---|-----|
| Fig. 1.1  | Conceptual Framework for an Integrated Study of Global Environmental Change in Mountains      | 4   |
| Fig. 2.1  | Mean Monthly Precipitation at Chitral and Drosh   | 22  |
| Fig. 2.2  | Chitral: Tahsil-wise Demographic Development (Selected Years)                                 | 38  |
| Fig. 2.3  | Torkhow Tahsil: Village-wise Population Growth (1981-1998)                                    | 38  |
| Fig. 2.4  | Odier: Clan-wise Population Distribution 2001   | 39  |
| Fig. 2.5  | Household Size in Odier 2001  | 39  |
| Fig. 3.1  | Odier: Share of Village Resource in the Subsistence Economy                                   | 49  |
| Fig. 3.2  | Odier: Clan-wise Location of Cultivated Land  | 51  |
| Fig. 3.3  | Odier: Clan-wise Land holding Status  | 54  |
| Fig. 3.4  | Odier: Cultivated Land Occupancy Variation from Mean (2.17 Acres)                             | 61  |
| Fig. 3.5  | Odier: Fields under Different Crops 2001  | 62  |
| Fig. 3.6  | Odier: Farm Size 2001   | 64  |
| Fig. 3.7  | Clan-wise Cultivated land Occupancy in Odier  | 64  |
| Fig. 3.8  | Odier: Utilisation of the Arable Land 2001  | 74  |
| Fig. 3.9  | Odier: House Design and Layout  | 78  |
| Fig. 3.10 | Odier: House Plan with other Associated Structures  | 80  |
| Fig. 3.11 | Somalay Clan: Management of Prangus pabularia (Moshin)  | 91  |
| Fig. 4.1  | Method of Field Irrigation in Odier   | 129 |
| Fig. 4.2  | Odier: Relationship between Household Size Cultivated Land Occupancy and Livestock Units      | 143 |
| Fig. 4.3  | Odier: Time and Space Organisation in Animal Husbandry  | 146 |
| Fig. 4.4  | Wool Processing in Odier Village  | 160 |
| Fig. 4.5  | Processing of Goats' and Yaks' Hair in Odier Village  | 164 |
| Fig. 4.6  | Households' Labour Allocation System in Odier   | 178 |
| Fig. 4.7  | Odier: Monthly Pattern of Gender Work Profile   | 179 |
| Fig. 5.1  | Village-wise Change in Literacy Rate in Torkhow Tahsil 1981-1998 (Persons 10 years and above) | 195 |
| Fig. 5.2  | Yearly Sale of Subsidised Wheat in Mehlp Valley (1992-2001)                                   | 206 |
| Fig. 5.3  | Yearly Sale of Subsidised Wheat in Odier (1992-2001)  | 206 |
| Fig. 5.4  | Pattern of Population Movement from Mehlp Valley  | 218 |
| Fig. 5.5  | Chitral District: Tahsil-wise Labour Force Working Abroad                                     | 222 |

## List of Tables

|          |   |     |
|----------|---|-----|
| Tab. 2.1 | Monthly Mean, Maximum and Minimum Temperatures of Selected Stations                                       | 23  |
| Tab. 2.2 | Population Growth in Chitral District (1899-1998)   | 37  |
| Tab. 2.3 | Social Status, Land Ownership, Land Revenue and Associated State Duties of the Households in Mehlp Valley | 42  |
| Tab. 3.1 | Field Size in Odier 2001  | 63  |
| Tab. 3.2 | Cropping Season in Odier Village  | 66  |
| Tab. 3.3 | Shaipay Clan: Moshin Management   | 94  |
| Tab. 3.4 | Bulay Clan: Moshin Management   | 95  |
| Tab. 3.5 | Pasture Utilisation in Odier  | 101 |
| Tab. 3.6 | Odier: Clan-Based Water Turns (sorogh) in the Irrigation Channels   | 108 |
| Tab. 3.7 | Inter-Village Pasture Utilisation Systems in Mehlp Valley   | 119 |
| Tab. 4.1 | Odier: Clan-based Livestock Ownership 2001  | 144 |
| Tab. 4.2 | Clan-based House ownership in Odier 2001  | 170 |
| Tab. 4.3 | Seasonal Movements of the Households in Odier   | 172 |
| Tab. 4.4 | Labour Exchange and Other Reciprocities in Odier  | 177 |
| Tab. 4.5 | Monthly Patterns of Gender and Children Work in Odier   | 180 |
| Tab. 5.1 | Odier: Clan-wise Migration Pattern and Off-farm Income Sources  | 216 |

## List of Maps

|         |  |    |
|---------|--|----|
| Map 1.1 | Location of Mehlp Valley in the Eastern Hindu Kush         | 8  |
| Map 2.1 | Mehlp Valley and Neighbouring Villages                     | 19 |
| Map 3.5 | Pasture Ownership in Mehlp Valley and Surrounding Villages | 97 |

## Supplement

|         |  |  |
|---------|--|--|
| Map 3.1 | Odier: Field Ownership and Occupancy Status 2001 |  |
| Map 3.2 | Odier: Clan-wise Field Ownership/Occupancy 2001  |  |
| Map 3.3 | Odier: General Land Use 2001                     |  |
| Map 3.4 | Odier: Cropping Pattern 2001                     |  |

# 1 Conceptual and Methodological Framework

## 1.1 Introduction

Present-day, research on development in high mountain areas<sup>1</sup> has to lay particular emphasis on two important factors: (a) the sustainable utilisation and management of mountain resources; and (b) the direct incorporation of mountain inhabitants in the development process. Studies of traditional resource-management practices with this emphasis on development and focus on the participation of the local inhabitants in the decision-making process have not only gained greater importance, but are also being recognised at higher political levels for the first time. Development agencies and policy makers have been encouraged in many ways to accept and accommodate indigenous resource-management strategies in their development activities and also to integrate the local population in the whole planning process, from the identification of problems to the implementation of the plan. This change in the general perception of development agencies, both in defining development and in formulating development strategies, has further necessitated more detailed research on local environmental knowledge systems.<sup>2</sup> These mechanisms are considered valuable resources, offering potentials for the sustainable development of mountain areas:

*“... a more sensible approach would have been to carefully study how these groups exploited their environment for centuries without degrading their resources significantly. In fact, we would argue that such knowledge is an asset that can be brought to the planning table and placed alongside funds and alien technologies as major ‘matching’ resources in the execution of sustainable mountain projects” (IVES, MESSERLI & RHOADES 1997: 464).*

Mountain resources include arable land, high pastures, grazing grounds, minerals, water and forests. These are not only essential for the survival of the mountain inhabitants, but also play a major role in the economic development of the respective forelands. These resources also act as binding forces between the mountain communities and their habitat, helping prevent large-scale permanent out-migration to the foreland urban centres. Mountain eco-systems are very fragile and highly susceptible to over-exploitation. The degradation and misuse of these resources not only affect the mountain communities, but also have a wide-ranging impact on the entire highland-lowland interaction system:

*“... it shows the research deficits towards an understanding of the complexities of human activities and economic penetration within a given mountain habitat. Territorial usurpation and the exploitation of natural resources are underestimated as the driving*

<sup>1</sup> Detail reviews and perspectives on the development of research activities on the mountainous areas can be found in TROLL (1988) IVES & MESSERLI (1990, 2001) WINIGER (1992) AND FUNNEL & PRICE (2003).

<sup>2</sup> ADAMS et al. (2003: 1915) have classified stakeholders' knowledge for the definition of resource use problems in three categories: knowledge of the empirical context; knowledge of law and institutions; and of belief, myths, and ideas.

*force of the habitat system in high mountain regions, as well as the contribution of socio-economic exchange relations between highland and lowland” (KREUTZMANN 1998b: 187).*

Thus, sustainability of mountain eco-systems lies in the proper management and judicious utilisation of resources.

Due to geo-ecological and physical constraints, mountains offer a diverse but relatively limited resource base. Both the combined and per-unit productivity of these resources vary from region to region. Generally, the regenerative capacity is very low and is controlled by many factors; therefore special care is needed to keep and maintain the long-term productivity. Guidelines for improved resource management in mountainous areas generally stress the importance of recognising the inhabitants’ own potentials and advocate a system of co-management:

*“... if mountain resources, in this increasingly resource-stressed world, are to be exploited in a sustainable manner, the upper watershed must be utilised as sensitively as possible. The most efficacious way of reaching and maintaining this large goal is to recognise the abilities of the mountain peoples and to work with them” (IVES, MESSERLI & RHOADES 1997: 456).*

Unlike the general trend in the plain areas, natural resources in the mountainous regions are vertically arranged and kept under different ownership regimes. This is one of the basic strategies of the mountain communities to economically utilise and share the life-supporting natural assets. Most of these resources are classified as common property, and management mechanisms have been organised through locally established autochthonous institutions (cf. NETTING 1974, 1976; GUILLET 1983; ORLOVE & GUILLET 1985; BUZDAR 1988; STEVENS 1993; EHLERS 1995, 1996, 1997; BERKES et al. 1998; KREUTZMANN 2000d and SCHMIDT 2001). These integrated management practices, appropriation methods and sharing of associated responsibilities are usually based on local knowledge and quite often present an incomprehensible state of affairs for the development agencies. The complexities in resource ownership and utilisation systems are further intensified by locally formulated responses to the scarcity of resources, and a lack of detailed information on the required scale (village, watershed or valley) further obscures the picture.

With regard to development, the general perceptions of mountain inhabitants – their problem definition, priorities, and formulation of possible solutions – usually differ from those of the lowland-based and politically motivated development agencies. In many cases this gap of understanding and mutual differences in outlook between government officials and mountain inhabitants have led to political marginalisation of the latter. The local people have been labelled as **part of the persisting problem** of ecological and environmental degradation in the mountainous areas, e.g. by ECKHOLM (1975). The cumulative effect of the antagonistic behaviour of the development workers and scientists towards the mountain inhabitants has created an environment of uncertainty, making decision-making and development activities difficult, particularly in the mountainous areas of the developing countries. Different aspects of this situation have been critically analysed and comprehensive suggestions made for future research,

resource management and the implementation of development projects, for example, in the Karakorum/Himalayan region (cf. HATLEY & THOMPSON 1985; SINGH & KAUR 1985; THOMPSON & WARBURTON 1985a & b; HEWITT 1988; IVES & MESSERLI 1989, 2001; BUTZ 1996; IVES 1998; KREUTZMANN 1998b, 2001; MÜLLER-BÖKER & KOLLMAIR 2000 and SMETHURST 2000).

Contrary to this negative observation, resource-management systems in the mountain regions seen within the historical context reveal completely different trends. For many centuries, natural resources have been utilised and managed by the local inhabitants through traditional village-based institutions. The villagers have formulated rules and regulations and defined responsibilities of the user groups, based on their traditional environmental knowledge. These knowledge systems are rooted in religion, culture and customs (STONE 1992: 115; GADGIL, BERKES & FOLKE 1993; AGRAWAL 1995; KURIEN 1995: 163 and SEELAND 1997). The traditional strategies and associated indigenous technical knowledge are not static, but flexible and open for modern innovations (cf. THURPP 1989). Within the historical process, new ideas have been incorporated and have become part of the present system:

*“In the course of centuries and in harmony with their often fragile and vulnerable environment, traditional autochthonous societies have developed forms of living of land use. Their knowledge and experience must be taken advantage of so as to assure the survival of future generations and to preserve or restore endangered eco-systems”* (EHLERS 1997: 81).

Indigenous resource utilisation systems are predominantly based on locally perceived equity and transparency, and emphasise the sharing of benefits as well as responsibilities (see below). The control mechanisms are appropriately designed and, with the passage of time, they have become part of everyday life. The implementation of rules is relatively easy, very cheap and compatible with the overall societal set-up (cf. OSTROM 1990; GADGIL & BERKES 1991; MCKEAN 1992a & b; RUNGE 1992 and PIMBERT & PRETTY 1998). The whole system is a product of clear principles of mutual trust, co-operation and accountability. Within the system, everybody knows his duties and rights. The user groups and communities are part of a decentralised and well-organised entity, having de facto or de jure powers for the formulation of rules regarding access to resources, appropriation methods and management practices. However, as a recent process these locally formulated rules, property rights and institutional arrangements are coming under heavy stress from both internal and external forces. The persistent increase in population, changing socio-economic structure and state intervention in the name of development are responsible not only for eroding the time-tested traditional systems, but also disfavours local initiatives of self-help and co-operative undertakings (JODHA 1997; BANSKOTA, PAPOLA & RICHTER 2000 and PARKES 2001).

As mountainous areas have been integrated into national as well as global economic and administrative networks to an increasing degree, globalisation processes are considered to be at least as important factors as environmental changes in promoting future change. They entail diverse implications for the functioning set-up and day-to-day life of mountain communities by changing the behavioural systems, traditional values and other associated socio-cultural characteristics (cf. JODHA 2000a & b). Traditional eco-

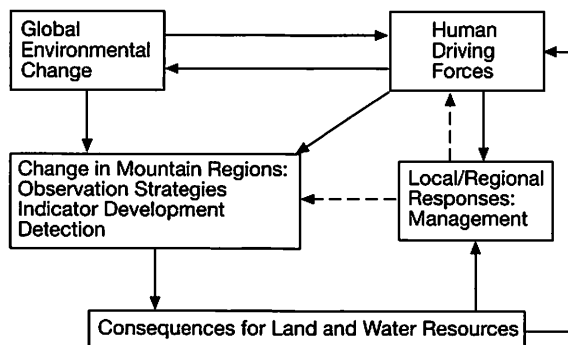


conomic systems and livelihood strategies, as well as demographic and administrative structures are all undergoing transformation. Rapid population growth in combination with a monetary economy and urban-oriented way of life is increasing the pressure on the fragile environment and the limited resources. The extraction of resources has become more exploitative in nature; traditional regenerative and regulatory efforts are losing their control. This in turn is accelerating the ecological degradation process, and the mountain people are increasingly dependent on the lowlands. Additionally, with the passage of time traditional systems of local infrastructure-maintenance, reciprocal practices and co-operative activities among the mountain communities are breaking down. Therefore, designing any sustainable resource management in mountain areas requires understanding that future changes will be driven simultaneously by global phenomena as well as by local and regional resource-management schemes (cf. Fig. 1.1).

At the same time, the mountains' capacity to provide goods and services to the mountain inhabitants as well as to supply the extra-regional demands of other communities is threatened. For that reason, geographers are emphasising the need for scientific investigations on changes in land use and land cover in the mountain areas and their effects on the livelihood strategies of the local communities:

*“Landnutzung und Landnutzungsänderungen sind daher ein Forschungsfeld, in dem die Auswirkungen der in diesen Räumen [Hochgebirgen] angewandten Überlebensstrategien untersucht werden müssen.” (DIKAU, KREUTZMANN & WINIGER 2002: 85).*

In practice, most of the development and conservation activities initiated by the state and other agencies have been based on conventional thinking, neither considering the mountain specificities (JODHA 1997), nor taking into account the creative adjustment of the inhabitants (EHLERS 1997, 2000b). As a result, the local actors are marginalised, their legitimate rights and basic needs denied. With respect to natural resource management, their power of decision-making and participation has been drastically curtailed (cf. CHAKRAVARTY-KAUL 1998 and BLAIKIE & SADEQUE 2000: 174ff.). Mountain people have been considered the main contributors in the ongoing deterioration and



Source Modified from BECKER & BUGMANN (2001: 21)

**Fig. 1.1 Conceptual Framework for an Integrated Study of Global Environmental Change in Mountains**

environmental degradation of their habitats, and their traditional practices have been labelled as signs of backwardness, inefficient and detrimental to modern developments. These negative approaches and perceptions are sometimes badly affecting the functioning capacity and decision-making authority of the age-old traditional institutions. Furthermore, they have also paved the way for eroding the traditional skills and know-how of the mountain communities, and have therefore, exacerbated the deterioration of the rural quality of life.

In contrast, there are many examples and empirical findings from all over the globe showing that mountain inhabitants have better knowledge of their local environment than the so-called “qualified” development professionals; and that their more rational and adjusted approach towards its management and conservation is superior to the professionals’ purely technical viewpoint (JOHNSON, OLSON & MANANDHAR 1982; KIENHOLZ et al. 1983; SCHROEDER 1985; WHITEMAN 1985, 1988; FORMAN 1988; IVES & MESSERLI 1989; SUTTHI 1990; TITILOLA 1990; ZURICK 1990; MÜLLER-BÖKER 1991; GUPTA 1992; RHOADES 1992; STONE 1992; SARMIENTO, MONASTERIO & MONTILLA 1993; SCOTT & WALTER 1993; HAAGSMA 1995; EHLERS 1996, 1997; MITCHELL 1997; NING 1997; CHAVERRI-POLINI 1998; DUFFIELD et al. 1998; CRITCHLEY 1999; PESTALOZZI 2000 and PARKES 2001). Therefore, a thorough knowledge of the functioning and resiliency of decentralised village-level resource management is one of the prerequisites for instituting sustainable development and conservation. The recognition and significance of those systems have been acknowledged in the *Agenda for Sustainable Mountain Development*. In this document, more stress has been placed on the empowerment and participation of mountain communities in the development process, and on the creation of a more mountain-oriented knowledge or “montology” (SOFFER 1982; IVES, MESSERLI & RHOADES 1997; SARMIENTO 2000, 2002 and SMETHURST 2000).

In compliance with the resilient and sustainable nature of community-based resource-management systems, during the 1990s more emphasis has been laid on understanding and clarifying of property rights. This has been particularly stressed in cases of common-property resources at both regional and local levels (FEENY et al. 1990; BERKES et al. 1998; MCCAY & JENTOFT 1998: 27; OSTROM et al. 1999; BLAIKIE & SADEQUE 2000 and MATTHEW 2001: 29). Meanwhile, research on natural resources and development-related issues in the mountainous areas has attracted the attention of many scholars in different academic disciplines, including geographers.<sup>3</sup>

At the regional scale of High Asia, recent research also shows significant environmental and socio-economic changes (e.g., GOLDSTEIN 1981; ALLAN 1984b, 1986; SKELDON 1985; KREUTZMANN 1993b, 1995, 1999, 2003; GOKHALE-CHATTERJI 1994; STELLRECHT & WINIGER 1997; STELLRECHT 1998b; STÖBER 2001 and NÜSSER 2003). The impacts of these changes can be seen in every aspect of the people’s struggle to make a living in this

<sup>3</sup> According to SMETHURST (2000: 44), more than 30 percent of the research articles published in the quarterly journal “Mountain Research and Development” from 1981 to 1998 dealt with different aspects of mountain development and issues related to natural-resource management and conservation. Furthermore, during the same period, the Hindu Kush-Karakorum and Himalayan region remained the main focus of scientific investigations, and 27.7 percent of a total of 263 research articles were written on this area (ibid: Tab. VI).

harsh environment. Here, the “modern” way of life and livelihood systems have rapidly encroached upon the traditional patterns. The traditional subsistence economy (mixed mountain agriculture) is going through a process of transformation. New economic activities are being introduced to supplement the old ones and to fulfil the growing demands of an increasing population. These off-farm and commercial activities have changed not only the utilisation of natural resources, but also the gender-based division of labour as well as the prevailing social values and structures. However, development activities in modern infrastructures and improved accessibility vary from place to place within the region, creating wide regional disparities in access to at least part of the modern economic activities (cf. IVES 1997). Except for a few localities, most the cash-income sources and off-farm activities are not available to inhabitants in their home villages. This has generated a reasonable scale of seasonal and permanent migration, both within the region and to the urban centres in the lowland. A substantial amount of household income is generated through migrant labour. Nevertheless, the local communities still give more importance and weight to the natural resources, irrespective of their present economic productivity (AASE 1998 and KREUTZMANN 2000a).

Presently, the conventional resource-management policies at the governmental level are under critical review in the Hindu Kush, Himalayan and Karakorum regions. This can be ascertained from the adoption of new mechanisms for resource management and sustainable development, whereby participatory approaches in natural resource management, as well as in development activities and conservation measures have been introduced in many countries of South Asia (cf. KOTHARI et al. 1998 and BHATIA 2000). Furthermore, the role of resource ownership, property rights, entitlement to life-supporting natural assets and their relevance to poverty-alleviation efforts in the Hindu Kush-Himalayan region is gaining considerable strength at decision-making levels. In this context, for the self-sufficiency of the local communities, the contemporary researchers have strongly recommended co-management systems (cf. BANSKOTA, PAPOLA & RICHTER 2000). Likewise more emphasis has been placed on defining property rights, changing existing resource ownerships and management systems, empowerment of the local villagers and ensuring their access rights and entitlement to natural resources (cf. MESSERSCHMIDT 1990; JODHA 2000 and MATTHEW 2001: 29). Meanwhile, at national levels, some of the leading steps for community-based management and conservation activities have already been initiated (BANSKOTA & JODHA 1992; KHATTAK 1998 and SHRESTHA 1998).<sup>4</sup>

Despite the above-mentioned new trends, so far there is very little change in the management of the natural resources owned or utilised by the village communities. The two main components of the village economy, agriculture and animal husbandry, are still carried out according to the indigenous practices (EHLERS & KREUTZMANN 2000b and KREUTZMANN 2000d). The access and utilisation rights are determined and maintained according to the old rules and regulations formulated by the feudal rulers' governments or have developed as old usage patterns. Except for a few cases, up-to-date

<sup>4</sup> The government of Pakistan has recently earmarked \$10.35 million (almost Rs. 600 million) for a seven-year project to protect and conserve the environment in the mountainous areas (THE DAWN, November 22, 2003).

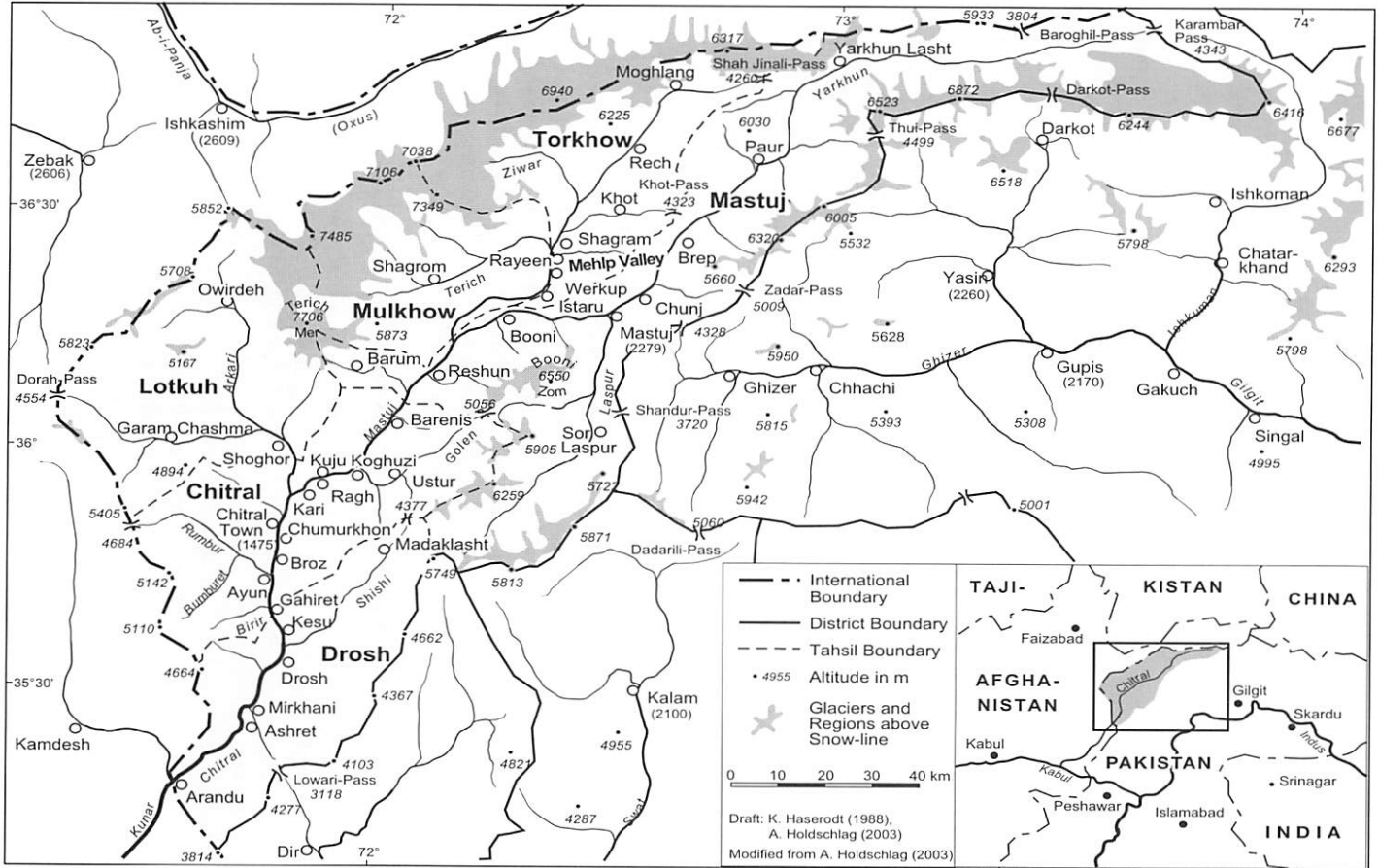
written records of land ownership and utilisation rights do not exist in the region. Most of the prevailing rules and regulations have become part of the local knowledge system and have been orally transferred from one generation to another. Without any proper documentation, these informal rules and access rights are known to the inhabitants of the individual villages as part of the collective community memory, and are mostly referred back to in conflict-resolution processes (cf. LENTZ 2000). On the other hand, there is also a growing concern and awareness among the communities regarding the degradation of their natural resources. Without any state intervention, the communities themselves are formulating rules and regulations for the sustainable utilisation and proper management of their natural resources (BAIG 1994).

At the micro level, the functioning of the decentralised resource-management system is very complex in every aspect. The distribution of both benefits and responsibilities is not always based on equity; however there is always an equity system perceived by the respective members (cf. MCGUIRE & NETTING 1982 and NETTING 1997). In the newly emerging scenarios and changing resource-management and development paradigms, there is a need for a very detailed and comprehensive knowledge of the functioning of the traditional systems, organisation and establishment of local institutions and use of authority. Public interventions without sufficient knowledge of the functioning of the system have led to difficult situations and counterproductive results. These conventional and authoritative approaches to development and use of resources are frequently incompatible with mountain specificities. Their application is causing the marginalisation of local communities and is increasing the mistrust and antagonism towards the state-sponsored projects, and thus is leading to unsustainable situations (cf. BLAIKIE & BROOKFIELD 1987: 35 and JODHA 1997, 2000b). This phenomenon of ecological, economic and social unsustainability is easily visible at the lowest level, i.e. households. To mediate and mitigate the negative impacts and to formulate appropriate coping strategies are regarded as challenges for human geographers and anthropologists (cf. BOHLE & ADHIKARI 1998: 326). Therefore, it is strongly recommended that geographical research on development issues should focus on various levels, ranging from local to global (cf. BEIER & RENGER 2003 and KRÜGER 2003).

## **1.2 Objectives and Central Questions of the Research**

The present research on resource management systems in the Mehlp Valley of the Eastern Hindu Kush is intended to show the complexities of man-environment interaction in an extreme periphery of the ecumene (Map 1.1). The physical potential of the resource base, management systems, property rights, and entitlement and utilisation patterns are discussed with associated responsibilities. Since physical determinants and resource productivity are not the only constituents influencing utilisation patterns (cf. HERBERS & STÖBER 1995; NÜSSER 1998a; EHLERS & KREUTZMANN 2000a; CLEMENS 2001 and SCHMIDT 2001), other relevant issues, such as village-based decentralised institutions, intra-inter-village access rights and changing ownership patterns of essential resources, are also taken into account. Political and demographic dynamics and the effects of “modernisation” are also covered.

Map 1.1 Location of Mehp Valley in the Eastern Hindu Kush



In this context, both the villagers' traditional and newly adjusted methods for successfully organising and maintaining the essential infrastructures on neighbourhood, clan and village levels are presented in detail, to highlight the managerial capacity and capability of the village community.

In the recent discussions on sustainable development, the local-level institutions and appropriation of resources have been considered relatively more sustainable compared to the respective state institutions, especially in the case of mountainous areas of the developing countries.<sup>5</sup> There is a general understanding that the causes leading to the "tragedy of the commons" (HARDIN 1968) need to be identified at a micro-level. This can be achieved through understanding and critically reviewing village-based resource management mechanisms (cf. Chap. 3.4). Although the literature on common-property resource management systems reveals both failures and successes (cf. OSTROM 1990; The ECOLOGIST 1992 and OSTROM et al. 1999), the geographers' contributions on common-property resource management systems have been comparatively insignificant (cf. GIORDANO 2003). It is very pertinent to determine the causes of failure and formulate remedial measures to avoid such situations (WASTON 1989: 66 and MCCAY & JENTOFT 1998: 27). In this respect the study of decentralised resource management systems may provide better opportunities to understand the functioning of a village system, co-operative undertakings and other socio-economic interdependencies among the households. Other key issues of resource management are also obvious at this level, such as appropriation of resource units, distribution of responsibilities, formulation and implementation of rules, appointment of village officials and use of authority, etc. These organisational measures are among the basic conditions leading to successful and durable resource management practices.

Due to explosive population growth, socio-political integration, economic restructuring at the national level and other globalisation processes, the functional capacities of traditional societies in the peripheral areas are declining. Government intervention and alienation of natural resources are undermining village-based management practices. Inconsistent politically motivated and top-down rural development approaches are often eroding not only the co-operative practices, but also the sustained and well-adapted resource utilisation mechanisms.<sup>6</sup> Village-level resource management and conflict-resolution systems are under stress, which is creating an unfavourable situation for the relatively poor and disadvantaged households. Meanwhile, as in other parts of the world, changes in the resource ownership from communal to individual property are also disfavoured the livelihood strategies of already marginalised sections of the community (cf. JODHA 1986 and GANJANAPAN 1998).

<sup>5</sup> Despite its complexities, community-based resource management at a local level has been considered one of the prerequisites for sustainable development: "Der Ansatz der Umweltverfügungsrechte geht zwar davon aus, daß *Community Management* (Sic!) der richtige Weg zu nachhaltiger Entwicklung ist, daß er aber mit vielen Problemen verbunden ist, die berücksichtigt werden müssen" (BÜTTNER 2001: 52).

<sup>6</sup> For further details on the ad-hoc nature of rural development programmes in Pakistan, see BOKHAR (1981), MANIG (1991) AND KHAN (1995).

Due to the complete absence of detailed written records on land ownership in the study area, traditional resource management practices and access rights of the villagers, as well as organised extraction systems, play a crucial role in the productivity of the resources. The latter are very complex and run through the entire gamut of ownership regimes, from individual to state and common property (cf. Chap. 3.4).

Moreover, the characteristics of Mehlp Valley serve as a lifescape of today (cf. Chap. 2). Examining the local systems can reveal their **transferability**, i.e. Mehlp Valley can be seen as a representative area, and help us appreciate the role of human response to environmental constraints, not only in the Hindu Kush-Himalayan range, but also in other resource-poor regions in the southern mountain ranges. As an area of least accessibility at the highest belt of the ecumene, with an increasingly scarce and fragile resource base, the traditional knowledge systems and their internal dynamics are playing a key role in the sustenance practices of the heterogeneous clan groups (cf. GADGIL & IYER 1989). Such historically based knowledge is unwritten information, held by cultural groups outside mainstream culture in all mountainous areas around the globe. In the light of modern environmental thought, the documentation, application and, where appropriate, the transference of associated techniques and thinking is difficult but essential for an overall development process. This holds true especially with regard to the local common-property resource management schemes and regulatory mechanisms, which have proven viable and developed further in a remarkable way under extremely difficult natural conditions.

Additionally, the area shows a typical imprint of how complex and ambiguous, externally induced modernisation and globalisation processes are bringing about significant environmental and socio-economic changes and tensions – patterns that have been witnessed in various mountain regions of the world. The study and empirical assessment of the related impacts, as well as of the communities' responses, not only reveals local specialities, but may also serve as an example for subsequent reflections in general montology. It may help especially by means of revisiting such paradigms as verticality, marginality, centrality or ethnic pride, and by identifying factors that indicate future directions.

This can be achieved by detecting and analysing the changes brought about by globalisation/modernisation at different levels, as well as their impacts. It further provides an opportunity to evaluate optimal combinations of traditional and innovative land use and resource management practices, in order to ensure the stability and resilience of those systems as well as the relevant institutions. This case study on Mehlp Valley shall provide feedback and guidelines for both development practitioners and policy makers at various levels. In this context, the following questions deserve a thorough analysis:

- What are the characteristics of the present resource base?
- Who owns these resources and how are the local management schemes performed?
- What are the contributions of those practices to a sustainable development process?
- What are the processes and impacts of change and what is the response of the communities to them?

- What is the role and status of traditional village-based institutions/organisations in resource management and utilisation?
- How and to what extent can local traditions and global pressures be reconciled and put into positive effects for sustainable development?

In this research, local-level resource management systems are analysed in terms of the resiliency, efficacy and sustainability of the relevant institutions. For this purpose, among others, the design “principles“ formulated by OSTROM (1990: 90 Tab. 3.1) and DIETZ, OSTROM & STERN (2003: 1910, Fig. 3) for long-enduring common property institutions are followed. The relevant ones are listed below:

- Clearly defined boundaries
- Congruence between appropriation and provision rules and local conditions
- Collective-choice arrangements
- Monitoring
- Graduated sanctions
- Conflict resolution mechanisms
- Minimal recognition of rights to organize.

Among other area-specific variables, the above-mentioned points have provided the basis for collection of relevant information on the management of common property resources in the study area. Therefore, all the individual topics were discussed in detail with the respective user groups in the whole Mehlp Valley. For this purpose, participatory methods such as group interviews and discussion with knowledgeable persons were applied to understand and record the functioning of common property resource management systems (cf. Chap. 1.4).

### **1.3 Status of Research and Sources of Information on the Research Area**

In Chitral, relatively little research work has been done so far on the utilisation and management of natural resources. Adventurers, mountaineers and colonial officials, as well as secret military missions, collected information on the area during the late 19<sup>th</sup> and 20<sup>th</sup> centuries. Most published material from the past contains general information on the structure and functioning of the state administration, as well as detailed accounts of the military operation in 1895 (e.g. BIDDULPH 1880; LOCKHART & WOODTHORPE 1889; AZIZ-UD-DIN 1897; ROBERTSON 1898; DURAND 1899; STEIN 1921; GENERAL STAFF INDIA 1928; GURDON 1933, 1934; SCHOMBERG 1934, 1936, 1938; BARTH 1956a & b; STALEY 1969 and JETTMAR 1974). Some of the studies are exclusively focused on settlement patterns, and design and layout of the traditional one-room house, such as POTT (1965), ISRAR-UD-DIN (1966, 1984), HUSSAM-UL-MULK & STALEY (1968) and HARRISON (1998). In addition to these sources, detailed accounts covering the historical, physical and socio-economic characteristics of the whole district have been presented by ISRAR-UD-DIN (1965, 1979); DICHTER (1967); MIAN (1986); HASERODT (1989a, 1996) and HOLDSCHLAG (2000). Different aspects of demography, ethnic



structure, social hierarchy and languages spoken in the district have also been studied in detail by ISRAR-UD-DIN (1966, 1971), DECKER (1992, 1996) and ANWAR-UL-HAQ & IJAZ (1996). EGGERT (1990) presents a comprehensive account of the earlier social organisation of the inhabitants of Torkhow and Mulkhow tahsils. This study also covers the distribution of different social groups in all villages of the above-mentioned Tahsils,<sup>7</sup> along with their prescribed responsibilities for the smooth functioning of the former Chitral State.

Detailed studies on geomorphological processes, landform development and vegetation cover in Chitral have recently been presented by HASERODT (1989b); KAMP (1999) NÜSSER (2001) and NÜSSER & DICKORÉ (2002). Comprehensive accounts on animal husbandry with associated resource utilisation and communal arrangements for seasonal livestock tending have been surveyed on the Kalash valleys (PARKES 1987, 1992, 2001) and other parts of the district (NÜSSER 1999). Khow and Kalash culture is also an important topic of research and documentation, as covered by such sources as HUSSAM-UL-MULK (1974a & b); SHAH (1974); STELLRECHT (1980); DENKER 1981; PARKES (1987); ALAUDDIN (1992) and BASHIR & ISRAR-UD-DIN (1996).

The latest studies are mostly concerned with the characteristics and development of Chitral Town. They cover the old trade relations in the 19<sup>th</sup> and early 20<sup>th</sup> centuries (KREUTZMANN 1998a), and the formation and spread of bazaars and changing land use and land cover in the core areas of the town (e.g. DITTMANN, FAZLUR-RAHMAN & HOLDSCHLAG 2000; NÜSSER 2001; DITTMANN & NÜSSER 2002 and HOLDSCHLAG 2003). KOMOLL & KAMP (1998) have presented a comprehensive account of the importance of education, employment opportunities for educated youth and location of schools and other educational institutions in the district. Recently, gender-specific issues and the role of women in a transitional society have become a topic of scientific investigation. This study is also mainly focused on the semi-urbanised town area of Chitral District (MEYER 2000).

The review of the historical documents and already published sources shows that the indigenous resource-management systems, traditional livelihood strategies and reciprocal activities have been neglected. Scientific studies on the functioning of village-level resource ownership and indigenous micro-level resource-management systems are lacking. Recently carried-out studies focus only on water resource utilisation and management (KHAN et al. 1994; ISRAR-UD-DIN 1992a, 1996, 2000 and BAIG 1997). MASOODUL MULK (1991) presents a general overview of agricultural practices, comparing the different strategies adopted by farmers in double- and single-cropping areas, without looking into other resource-management systems. As part of his integrated research on *Habitat in the Highlands of Pakistan*, ISRAR-UD-DIN (1995a & b) discusses utilisation patterns, access rights and management practices of pasture resources in Ghizer and Chitral districts. Furthermore, FAIZI (1999) highlights the traditional community-based resource management practices in Chitral, defining the locally used terms and connotations. ALI & LE FEVRE (1996) present an account of the traditional knowledge with respect to the indigenous utilisation of medicinal plants. Many reports and publications of Nongovernmental Organisations (NGOs) such as *Aga Khan Rural Support*

<sup>7</sup> Tahsil is a lowest administrative unit in Pakistan and there are six Tahsils in Chitral District.

*Programme (AKRSP)* and *Chitral Area Development Programme (CADP)* as well as the latest reports and studies conducted by the International Union for the Conservation of Nature and Natural resources (IUCN) for Chitral Conservation Strategy (CCS) were also consulted. Many publications of provincial and federal governments, e.g. census reports of Chitral District and statistical yearbooks of North West Frontier Province (NWFP), were some of the main sources for comparable secondary data. Furthermore, reports on resource-ownership conflicts and related issues were also collected from the English- and Urdu-language newspapers published in the main cities of Pakistan. Daily access to these papers was possible through the Internet

## **1.4 Research Methodology and Data Collection Procedures**

This study is mainly based on primary data that has been collected from the study area by employing various research methods, including interviews and verification of remotely sensed data. The relevant information from the field was gathered in two phases. Preliminary data on resource management, traditional institutions, reciprocities and co-operative activities at village levels were collected through informal discussions and recorded during the summer of 1999. Based on this information, a comprehensive questionnaire was formulated. During a subsequent two-month (July and August) fieldwork in the summer of 2001, the required data for this study were collected.

### **1.4.1 Self-Administered Questionnaire Survey and Group Interviews**

Systematic data collection was carried out through structured questionnaire surveys in all the settlement units (villages) of Mehlp Valley, namely: Ghorda,<sup>8</sup> Shoat, Mehlp proper and Odier. The aim was to determine the functioning systems and administrative capacity of the autochthonous village institutions. Further details on local-level organisations for carrying out agro-pastoral activities, inter-village co-operation and resource management institutions were also recorded. For this purpose, expert interviews were conducted with knowledgeable persons in the respective villages. This information was crosschecked through participatory appraisal methods and group interviews. This provided detailed information on resource ownership, appropriation methods, management and related responsibilities at the village level. Secondly, information on the organisation of day-to-day life in the respective villages was also collected, including farming systems, animal husbandry, marriage/burial arrangements, infrastructure management and maintenance. Relevant details on the establishment and functioning of the Aga Khan Rural Support Programme (AKRSP) were also recorded through group discussions in all of the villages.

Detailed information on all the above-mentioned topics at the household level (App. 1.1 - 1.4) were collected in one village of Mehlp Valley, i.e. Odier. In this case, aside

<sup>8</sup> The small hamlet of Ghorda is located outside of Mehlp Valley, about 5 km to the north-west. Socially as well as politically it is considered part of Mehlp Valley, since almost all the households of this hamlet migrated from this valley and still share some common-property resources with the inhabitants of Shoat village (cf. Tab. 3.3 and Map 3.5). Furthermore, this hamlet participates with Shoat village in village-level reciprocities, such as burials and marriages, etc. and is also included in the Mehlp union council constituency. EGGERT (1990: 181) also treated this hamlet as part of Mehlp Valley (cf. Tab. 2.3).

from group and expert interviews, individual household heads and sometimes female household members were also interviewed by means of a structured questionnaire.<sup>9</sup> This provided a detailed database on individual livelihood patterns and strategies, population composition and employment structure. Similarly, per-household numbers and different species of animals, and changes in livestock ownership, were recorded. With respect to resource management, detailed information was gathered on all the pastures of Odier Village. Pasture-management systems, as well as the appointment of watchmen, access to pasture resources and utilisation rights were discussed with the individual user groups. Distribution and entitlement of irrigation water along with their associated responsibilities, such as communal labour mobilisation for channel maintenance as well as appointment and payment of the irrigation officials, were also gathered for the irrigator groups in the village.

The tenancy system in the village was discussed with the local tenants. For information on the management of fodder resources at clan levels, i.e. *Prangos pabularia* (*moshin*), members of the respective clans were interviewed so the distribution and organisation system could be reconstructed (cf. Chap. 3.4.3.2). The traditional systems of animal husbandry were recorded, and the new innovations and changes were discussed with the respondents. Information on the functioning structure of the newly established organising committees responsible for micro-hydel management (cf. Chap. 5.7.2) and matters related to the hired shepherd (*gujur*) (cf. Chap. 5.3.2) were recorded from the respective committee members. The sale point provided the required information on the carriage system of subsidised wheat and other relevant matters (Chap. 5.2.4).

#### **1.4.2 Mapping Procedure: Use of Remotely Sensed Data and Application of GIS**

For the purpose of detailed mapping, panchromatic IKONOS satellite images of the study area with one-meter spatial resolution were used as a single source of information (App. 2.) This product is known as CARTERRA™ GEOPRODUCT (CARTERRA™ Geo), with ± 50 meters (CE 90%) horizontal accuracy. The acquisition date of the image (main source for mapping) was 28<sup>th</sup> April 2001 at 06:00 GMT, and IKONOS-2 sensors were used for this purpose. After initial processing, i.e. geometric correction and geo-referencing by Space Imaging Middle East, these images were made available to the author in a CD-ROM in Geo-Tiff format with 11 bits per pixel, through the distributor GAF mbH, Space Imaging Europe (App. 3).

The mapping procedure was initiated with the process of digitising the individual fields and other land-use categories for Odier Village from the satellite image, using Arc View 3.2 GIS software. The preliminary sketch map was drawn and printed before visiting the study area. During the fieldwork, July-August 2001, all fields were visited and relevant information was also noted down on ownership, source of irrigation, status of holding, and on the standing crop(s). The field boundaries on the map were compared with the actual ones and corrected. During the fieldwork, some complexities in the

<sup>9</sup> At the time of field survey there were 120 regular households in Odier. Additional two households, residing elsewhere, owned arable land in the village. Except land ownership/occupancy data no other information on these households was available to the author.

cropping pattern were also registered. In many cases, a regular field was divided into two or three subsections and given to more than one crop. For example, fallow was usually combined with either maize or potato, and similarly, some minor crops were also grown with a principal crop on a single field. After confirming the temporary field boundaries, such fields were placed in the category of the main crop grown on it.

Due to the small sizes and other difficulties in demarcating the boundaries of the newly reclaimed areas, it was not possible to assign individual ownership to the respective parcels, and thus the whole land was placed under a single land-use category. The same problem was faced in the demarcation of boundaries for individually owned pastures, uncultivated land and plantations. Thus, with the exception of regular fields, all other land in individual ownership was placed collectively in different land-use categories without defining the respective owners (cf. Map 3.3, suppl.). Consequently, it was impossible to get absolute figures on household arable-land ownership, even though the mapping process was partly carried out in the field and the general quality of the images were excellent, with minimum cloud cover and optimal visual reflection (cf. App. 2).

Quantitative data on land ownership and land use was created with the automatic area-calculation method of the GIS software. The whole attribute table of fields, including the newly added columns, was transferred from Arc View to MS Excel for further analysis and calculations. This was done systematically for each household, clan and village, using all relevant parameters, i.e. ownership, crops, location of fields, etc. In this way, a detailed land use and land ownership database was created for the village (App. 4.1 and 4.2). This main database on land ownership and cropping pattern can be updated and used for long-term research purposes. For the present study, only a single year's data (2001) on cropping pattern was analysed, and maps and figures were drawn based on this.

Both field and farm size in Odier are quite small, and almost all of the 1,073 regular fields and more than 63 percent of the total farms were smaller than one hectare (2.47 acres) in area. Therefore, acre has been adopted as the measurement unit for the entire data analysis, figures and tables (cf. Chap 3.2.5.1). For detail analysis and comparison, the available quantitative data has been arranged at three levels, namely household, clan<sup>10</sup> and village.

Since the clans (as a secondary interest group after households) shoulder most of the communal responsibilities in the village (cf. Chap. 4.6.4), clans are used as a unit for comparison in most cases, such as land ownership, off-farm sources of income, live-stock ownership, etc. In the case of other resources, such as pastures, irrigation water, etc. the beneficiary households are treated as "decentralised user groups", as they have de facto (quasi de jure) ownership of the concerned resources.

<sup>10</sup> In this study, (to avoid any confusion), the term *Clan* is used for the six patrilineal groups living in Odier. For more details on the distribution of individual clans, social hierarchy and corresponding duties during the local-rule period of Chitral State, see BAIG (1994, 1996, 1997), BIDDULPH (1880), EGGERT (1990: 38ff.), FAIZI (1996b), GENERAL STAFF INDIA (1928), GOP (1999), ISRAR-UD-DIN (1965, 1992, 1995a & b, 2000) AND SHAH (1974).

They also have the authority and established local-level institutional arrangements for devising utilisation and management plans (cf. Chap. 3.4.4), and moreover, they can collectively change the prevailing ownership regimes; therefore they are considered as owners.<sup>11</sup>

### **1.4.3 Archives Research in India Office Library London**

In addition to the detailed fieldwork conducted in the study area, the British Library (India Office Library & Records) and the School of Oriental and African Studies (SOAS) were visited for almost three weeks in April 2002.<sup>12</sup> This provided an opportunity to get historical information on different aspects of the former State of Chitral. Different colonial documents were consulted, including gazetteers' reports and other correspondence between the India Office and British political agents posted in Chitral from 1895 onwards. The colonial records were among the basic sources of information on the system and political organisation of the state, sources of income, such as trade, as well as realisation of land revenue and other taxes. The organisation of state duties and changes that occurred during the colonial rule were also documented and forwarded to the India Office as part of the official correspondence. However, compared to other localities in the Northern Areas of Pakistan and other parts of Chitral District, no detailed records and only few relevant material were found on the present Torkhow Tahsil. Similarly, very limited information was found on Mehlp Valley.

## **1.5 Composition of the Thesis**

The present study is divided into six chapters. In this chapter, the conceptual and methodological framework is discussed. In the second chapter characteristics of the study area are described in detail. The different physical and socio-cultural factors influencing resource-management systems are considered. Location and geo-ecological set-up are discussed with respect to their relevance to the natural endowment of resources and their productivity, both of which depend on elevation and precipitation regimes. The evolution of property rights and resource ownership is discussed, starting with the former political organisation of the present Chitral district up to today. Furthermore, demographic developments are also taken into consideration.

In the third chapter, ownership and management of natural resources are analysed. The various types of ownership and access rights to different resources in Odier Village are focus of the discussion. The local tenancy system, alienation of land kept in individual property, as well as use of paths and roads has been explained to highlight the effectiveness of customary law and accumulated traditional knowledge systems. The different ownership regimes, ranging from individual and group to village, are treated in detail, along with management mechanisms and appropriation of resource units. The system of membership in clan or group property is also elaborated upon, with

<sup>11</sup> For further details on different aspects of ownership status and its relevance to resource management practices see SCHLAGER & OSTROM (1992).

<sup>12</sup> Under the umbrella of Culture Area Karakorum (CAK) inter-disciplinary research programme, two projects in the field of cultural geography were simultaneously initiated in Chitral. To increase the efficiency, we (myself and my friend Arnd Holdschlag) conducted the literature research in the India Office Library and SOAS together.

particular reference to the associated responsibilities the individual members must fulfil to maintain their ownership titles.

The fourth chapter focuses on traditional adaptation systems. This chapter has been divided into six major parts. The investigation is initiated with an exposition of farming practices, starting with the spring season. This is followed by the second most important sector of traditional livelihood – animal husbandry. Different aspects of animal husbandry are discussed, starting with the economic and socio-cultural significance of livestock, and including animal husbandry's relevance to agriculture, the exchange system between in-laws, as well as organisation in space and time.

Off-farm sources of income as contributors to the traditional village economy are treated in the next section of chapter four. This is followed by an analysis of the important livelihood strategies of mountain inhabitants, i.e. seasonal movement and organisation of labour for carrying out farming activities, animal husbandry and maintenance of important village infrastructures. Mutual consensus in seasonal movement and exchange of labour are highlighted to show the high level of interdependency. The services of village artisans and their importance for the traditional economy are also assessed, with particular reference to the traditional payment system.

The fifth chapter covers changes and innovation in the traditional economy during approximately the last three decades. The discussion begins with changes in agriculture; more specifically in land ownership, cropping patterns and the dependence on the lowlands for basic food needs. This is followed by changes in animal husbandry, focusing on livestock ownership and grazing arrangements. The modifications in house design and building materials are also referred to in Odier, to point out the response of the villagers to the declining supply of timber as well as to the village's new accessibility. New sources of off-farm income and out-migration patterns are discussed in detail, to highlight the role of cash income for the subsistence of the villagers. The socio-economic consequences of long-term out-migration are also investigated in detail.

In the 1980s, NGOs became active in the development sector, reaching also into the far-flung villages of Chitral district. The next section of chapter 5 critically evaluates their activities in infrastructure development and the response from the local communities. The villagers' institutional arrangements for maintaining the newly constructed infrastructures are also analysed in detail, to point out their managerial capacity for taking care of such infrastructures without financial support. This is followed by an analysis of the negative and positive impacts of all these transformations on the society.

In the last chapter, the results of the study are discussed in the context of sustainable development in the Eastern Hindu Kush. In the face of rapid and unprecedented transformations and the globalisation process, a few suggestions and guidelines that have been deduced from the study are made for future policies of resource management and sustainable development, as well as for further intensive research studies.

## **2 Physical and Anthropogenic Characteristics of the Research Area**

### **2.1 Ecological Characteristics and Physical Resource Potential of Mehlp Valley**

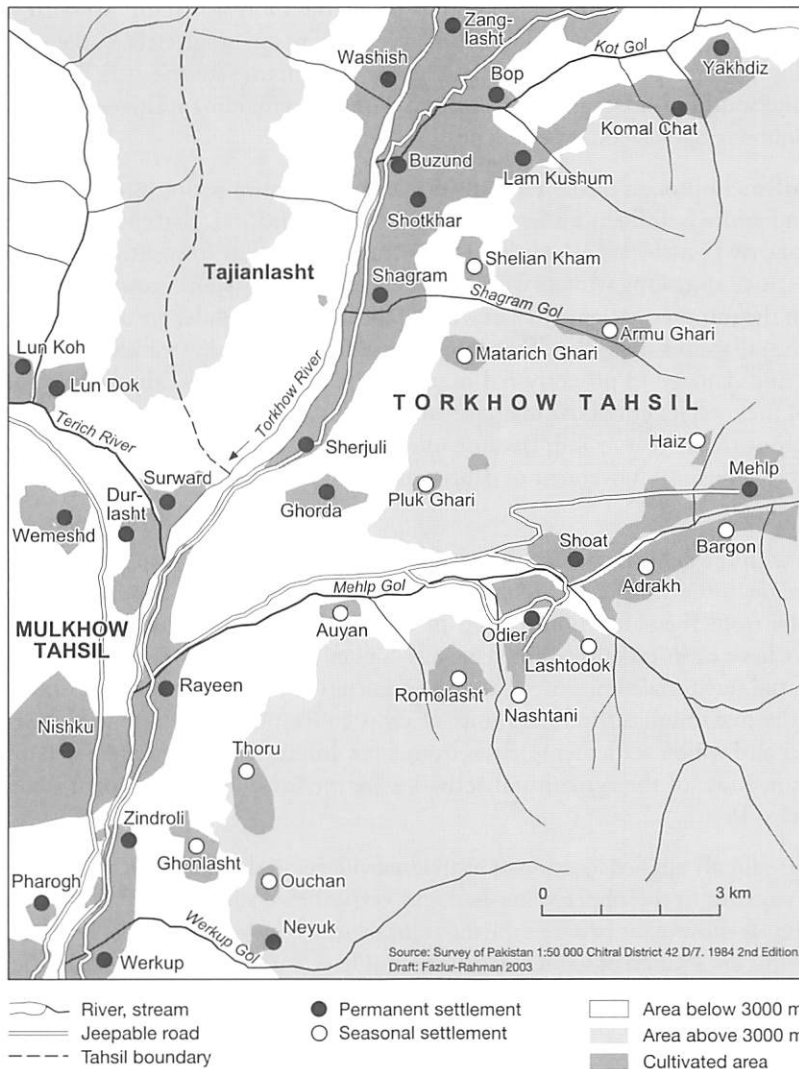
The physical set-up of Mehlp valley, with its inherent potentials and limitations, plays a major role in how natural resources are used in the area. Many variables, including location, elevation, aspect and other site-specific factors, must be taken into consideration if one is to understand the resource dynamics. These factors influence not only the farming enterprise (WITCOMBE 1977; UHLIG 1978; WHITEMAN 1985, 1988; MAHARAJAN et al. and 1990 KREUTZMANN 1995b, 2000e), but also play a major role in access and entitlement to pasture resources (EHLERS 1996) as well as ownership of cultivated land and composition of livestock (SAUNDERS 1983; PARKES 1987; MASOODUL MULK 1991 and CLEMENS & NÜSSER 2000). In the mountainous environment of the survey area, the actual status of a resource base – its regenerative capacity, as well as the territorial ownership and utilisation systems practised there – is closely related with ‘location-specific’ factors. Moreover, the local management mechanisms are formulated based on two additional factors: the relative importance of any single resource (i.e., pasture, range land or irrigation water) for the traditional subsistence system, as well as how dependent the concerned community is on that resource for securing its sustenance. In many instances, the “perceived economic importance” of a resource plays a major role in the distribution and allocation of resource units among the co-owners within a local set-up at both the village and valley levels.

#### **2.1.1 Location and Topographical Features**

Mehlp valley is located in Torkhow tahsil, an extreme periphery of Chitral district, about 120 km northwest from the district headquarter in the Eastern Hindu Kush (Map 1.1). The main Torkhow valley is located between the Terich Mer and Nowshaq massifs and the Torkhow-Mastuj divide. For the last two centuries the direct connections between Torkhow tahsil and the Wakhan corridor, crossing the high passes of Kotgaz and Anoshah, have been permanently cut off due to large-scale glacier formations (cf. SCHOMBERG 1936, 1938).<sup>13</sup> Consequently, the whole valley is a typical cul-de-sac structure, without direct access to the historically important Hindu Kush passes (cf. FAIZI 1996b: 100ff).

The only route that has remained accessible is the Shah Jinali pass (4,260 m), which connects the Torkhow tahsil with Yarkhun valley and, further, with the Wakhan corridor in the west. This pass is relatively easy to cross and free of snow from the first week of July until the end of October. Due to these locational factors, compared to other valleys (i.e., Yarkhun, Laspur and Lotkuh), this area had very little strategic and political importance during the famous “Great Game period” in the 18<sup>th</sup> century. There are other seasonal passes connecting the different valleys and villages within Torkhow tah-

<sup>13</sup> For more information on the relationship with Wakhan through these high passes and related historical (oral) evidences, see HASERODT (1989a), especially endnote 10 and FAIZI (1996b).



**Map 2.1 Mehlp Valley and Neighbouring Villages**

sil; however, most of them are used only for pedestrian traffic for three to four months during the summer season.

Mehlp valley is about 20 km long and comprises the northwestern part of the Torkhow-Mastuj divide. A stream known as Mehlp *gol* with its tributaries drains this area, and May and June are the peak runoff months. There are three permanent villages here, located between 2,800 and 3,500 m altitude on both the north- and south-facing slopes, accommodating 400 households.<sup>14</sup> The surrounding mountains along the southeastern

<sup>14</sup> A total of 27 households are living in Ghorda. Most of these households have socio-economic ties with the Shoat villagers (cf. 3.4.6.1).



watershed rise up to 4,500 m and are thus below the snow line (cf. HASERODT 1989a: 68, Fig. 15). Therefore, due to low-relief energy, there are no glaciers in the watershed of Mehlp gol, except for two small patches in the extreme southeast.<sup>15</sup> Both the northern and southern ridges rise up to around 3,400 m, providing relatively easy access to the neighbouring villages, especially in summer.

The settlement process in the Hindu Kush and Karakorum region is closely associated with and strongly influenced by different natural hazards (cf. SAID 1991, 1995, 1998 and KREUTZMANN 1994). The valley under study also suffers from a number of natural hazards, including long winters with its associated relatively short growing season (especially in the summer settlements), as well as landslides. Landslides are a common hazard in all the villages of the valley. There are localised hazard-prone areas, where substantial loss of and damage to property has occurred due to landslides. Moreover, about one third of the total length of the main jeepable road is also prone to this hazard and needs continuous repair year round. Because of the nature of landslide hazard, which ranges from very slow mass movement to debris-fall, there is no possibility either of mitigating or stopping it.

In line with the general characteristics of land use and resource management in mountainous areas, the villages in Mehlp valley have clearly defined boundaries and extend vertically from the valley bottoms up to the watershed. Consequently, summer settlements have been established at relatively higher altitudes or on north-facing slopes within the territorial limits.<sup>16</sup> All the seasonal settlements are cultivated, and extend up to the maximum altitudinal limits of crop cultivation. The distance between the summer and winter settlements varies from a few hundred meters up to a maximum of three km. Most of the agricultural activities are carried out from seasonal settlements (cf. Chap. 4).

The altitudinally aligned location of individual villages in the valley, with their respective alpine pastures in the upper watershed and vertical extensions of arable land, necessitates regular movement between the different seasonal settlements. Most of the summer settlements are located at higher elevations and have a northern exposure. In the upper part of the valley, some of the summer settlements with cultivation have been extended to 3,700 m, the highest cultivated altitude in the Eastern Hindu Kush. These houses are usually occupied in late spring or early summer, with the individual villages deciding exactly when according to their own internal systems. It is common in the valley to own two houses at different altitudinal levels; many households even have three houses, which the owners occupy sequentially. The importance of this seasonal movement can be assessed from how common the practice is. More than 85 percent of the households

<sup>15</sup> According to local belief in both the Hindukush and Karakorum regions, glaciers are considered to be paired living organisms with gender attribution, i.e., male and female (cf. HASERODT (1989a) and ITURRIZAGA (1997: 325). The survey valley ascribes to this belief, as well.

<sup>16</sup> For more details on territorial utilisation rights and entailment to natural resources in the villages of Northern Mountainous bet of Pakistan see ALLAN (1989); KREUTZMANN (1989); EHLERS (1995, 1996, (1997); CLEMENS & NÜSSER (1994, 2000); HERBER & STÖBER (1995); CHAUDHARY (1997); CLEMENS (1998, 2001); JANJUA (1998) and NÜSSER (1998a & b).

of the valley participate, in order to have better access to the summer pastures and to conserve some resources at their winter houses (App. 5). How long a household stays in these seasonal settlements is not fixed, varying from one to six months depending on the affordability and the individual households' arable-land ownership.

Since 1979 Mehlp valley has been connected to the main Chitral-Torkhow road by a 15-km-long fair-weather jeepable road. Currently, most of the neighbourhoods in the valley are connected with this road. This main road remains open for traffic throughout the year, depending on down-valley road conditions.

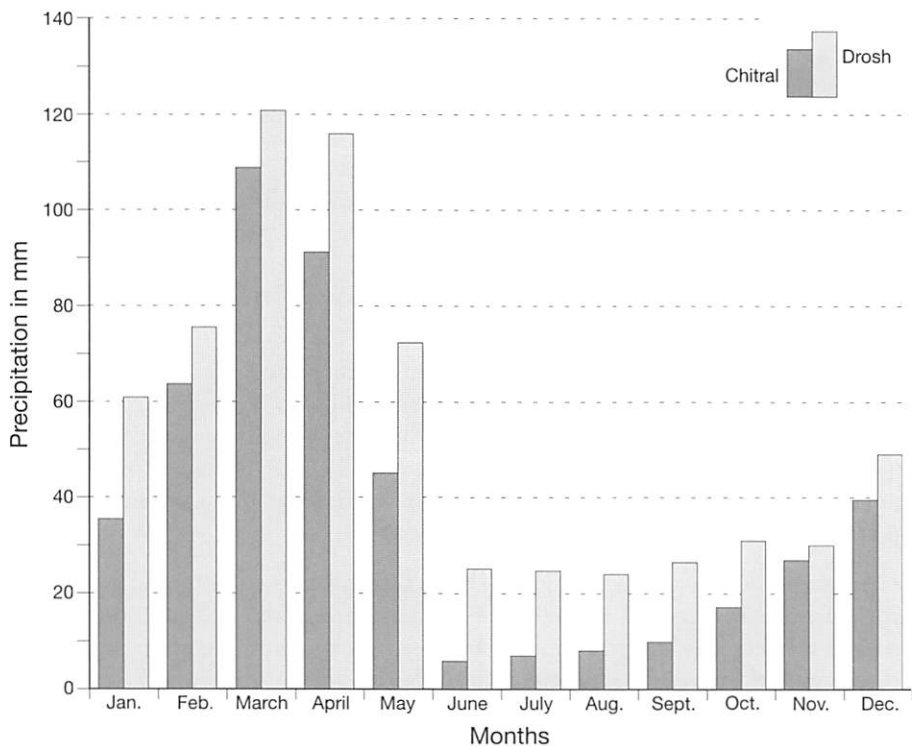
### **2.1.2 Climatic Characteristics**

Climatic elements – especially precipitation, temperature, sunshine and localised wind systems – are crucial factors in determining the availability of water and productivity of the natural resource base. Together they define the agricultural system, the seasonal water availability and local crop suitability. The temporal characteristics of precipitation, cloud cover and temperature conditions are extremely important for vegetation growth and crop maturation in the high-altitude villages.

Climatic conditions of the Eastern Hindu Kush are characterised by typical high mountain elements, with seasonal extremes of both temperature and precipitation. Most of the Eastern Hindu Kush is a transitional area between the humid foothills in the south and the very arid Central Asian region in the north and northwest and is located in a rain shadow. The available data reveal more rainfall in winter and early spring, a few sporadic showers in summer and an occasional intrusion of monsoon, usually in the month of August (HASERODT 1989a: 61; REIMERS 1992: 51 and WEIERS 1995: 11). Localised and sporadic thundershowers are common during the summer season. These cause heavy debris-flow in the streams, and seasonal torrents (WASSON 1978 and HASERODT 1989b), thus damaging the essential infrastructures, i.e. roads and irrigation channels.

Precipitation and temperature, both vary according to altitude. Generally precipitation increases with elevation and temperature decreases. Truly humid conditions can be found at altitudes higher than 4,500 m, where the annual precipitation is calculated to be more than 1,500 mm (cf. PAFEN, PILLEWIZER & SCHNEIDER 1956; YAFENG & XIANGSONG 1984; HEWITT 1989; OWEN & DERBYSHIRE 1989; MIEHE et al. 1996; DU 1998; JACOBSEN 1998 and MIEHE et al. 2001). Valleys up to about 4,000 m, however, are almost dry, with less than 150 mm of precipitation. Therefore, within the cultivated- and settlement-territory limits of the survey area (at 3,700 m), the rate of evapo-transpiration is always higher than the precipitation throughout the entire vegetation period. Without artificial irrigation there is very little possibility of crop cultivation and vegetation growth.

In Chitral, both seasonal changes and spatial variation of rainfall from south to north are very prominent (Fig. 2.1) The southern part of the district receives more rainfall, both from summer monsoons as well as from western disturbances, whereas the effect of both rainfall regimes sharply decreases towards the north and northeast (HASERODT 1989a and WEIERS 1998). Only in the areas around the Terich Mer and Booni Zom



Source WEIERS (1995: 29 Tab. 2)

**Fig. 2.1 Mean Monthly Precipitation at Chitral and Drosh**

massifs are there extensive glaciers. In the valley bottoms extremely arid conditions prevail throughout the year, except in the winter months, when due to low temperature conditions, snow remains on the surface of the side valleys (above 2,900 m) for about three to five months, depending on the altitude and exposure. This winter and early-spring precipitation collects in the high altitudes, and serves as water storage for the dry summer season. Due to the morphological conditions, the main rivers, which are usually fed by glaciers, are not suitable for irrigation. Rather, the tributary streams and seasonal torrents, mostly fed by snowmelt and springs, are the main sources of irrigation throughout the whole region. Accordingly, the existence and expansion of settlements depend not only on land resources, but also on seasonal water availability for irrigation. Water is the principal factor in the productive utilisation and extension of arable land.

Temperature conditions also show the same high rate of variability, depending on altitude and aspect (cf. WEIERS 1995 and CRAMER 1996, 1997). Above 3,200 m altitude the thermal vegetation period is reduced to only five months per year (Tab. 2.2). At these higher elevations, snowfall is common even during the summer season (in July and August), whenever there is a prolonged spell of precipitation. At this altitude the diurnal temperature range is extremely high, with temperatures dropping below 0°C at nighttime (cf. PEER 2000: 315). The resulting short growing season affects the yield of

crops in the summer settlements. Both the high altitude and the short growing season have negative effects on the vegetation growth.

In Mehlp valley, the temperature remains below freezing for five to six months, from mid-October till the end of March. In the northerly exposed areas, snow usually remains on the surface from December until the end of April, whereas the south-facing slopes remain free of snow the whole winter season. Due to extreme temperature conditions, however, no agricultural activity is possible until the beginning of March. Similarly, in all the villages of Mehlp valley vegetation period is limited to less than six months. The whole valley is located in a single cropping zone, and in the high-altitude summer settlements only fast-maturing crops are grown.

**Tab. 2.1 Monthly Mean, Maximum and Minimum Temperatures of Selected Stations**

| Stations | Jan   | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec   | Year | Ext.  |
|----------|-------|------|------|------|------|------|------|------|------|------|------|-------|------|-------|
| Chitral  | 8.7   | 9.9  | 15.0 | 21.8 | 27.5 | 34.6 | 36.0 | 34.8 | 31.0 | 25.0 | 18.2 | 11.1  | 22.9 | 44.4  |
| 1,499 m  | -0.6  | 0.5  | 4.2  | 8.6  | 12.5 | 17.9 | 20.3 | 19.1 | 13.3 | 7.6  | 3.1  | -0.1  | 8.9  | -11.0 |
| Mean     | 4.1   | 5.2  | 9.6  | 15.2 | 20.0 | 26.2 | 28.1 | 26.9 | 22.2 | 16.3 | 10.6 | 5.5   | 15.8 |       |
| Drosh    | 8.4   | 10.8 | 16.1 | 22.4 | 28.6 | 35.3 | 36.6 | 35.8 | 32.8 | 26.9 | 18.4 | 11.5  | 23.6 | 44.0  |
| 1,465 m  | -0.4  | 0.9  | 5.3  | 10.1 | 15.0 | 20.6 | 23.1 | 22.3 | 18.3 | 11.9 | 6.1  | 2.1   | 11.2 | -9.0  |
| Mean     | 4.0   | 5.9  | 10.7 | 16.3 | 21.8 | 27.9 | 29.8 | 29.0 | 25.6 | 19.4 | 12.3 | 6.8   | 17.4 |       |
| Misgar   | -1.1  | 1.8  | 6.9  | 12.4 | 16.7 | 21.0 | 24.2 | 24.8 | 20.4 | 14.1 | 6.8  | 0.9   | 12.5 | 32.2  |
| 3,106 m  | -12.0 | -8.9 | -4.7 | -0.1 | 4.3  | 8.2  | 11.2 | 10.5 | 5.2  | -0.8 | -6.6 | -11.1 | 0.0  | -18.9 |
| Mean     | -6.6  | -3.6 | 1.5  | 5.8  | 10.5 | 14.6 | 17.4 | 17.8 | 12.9 | 6.7  | 0.1  | -5.2  | 6.0  |       |

Source Weiers, (1995: 32f.) Ext. Absolute daily maximum, minimum

Temperature conditions place high restrictions on the local agricultural practices, and horticultural is impossible throughout the Mehlp valley (cf. HASERODT 1989a: 121). A very limited number of fruit trees, such as apricots, apples and walnuts, have been planted in the lower part of the permanent villages, at an elevation up to 2,900 m. Above this altitude the annual growth and second-year survival of fruit trees remains very critical. The upper Mehlp valley is already too high to allow any possibility of poplar plantation, and maize as a single crop is grown only in the lower parts of the valley (below 3,000 m). The long winters and restricted growth of vegetation result further in an extreme shortage of firewood and fodder throughout the valley. Therefore, compared to other areas, such as Gilgit, Hunza and lower Chitral, there is no possibility of developing horticulture as an additional means of cash income.

### 2.1.3 Natural Vegetation Cover

As a result of the extremely arid conditions in northwest, north and northeast Chitral, together with the high altitude, the valleys and surrounding hill slopes are virtually treeless. The only exceptions are the birch and willow groves growing in water surplus areas along the river. Some patches of highly degraded juniper forests are also found around 3,400 m. Most of the natural vegetation consists of drought-resistant plants, including many species of artemisia at the lower altitudes and different varieties of *Acantholimon* spp. at higher elevations. Other naturally growing thorny bushes, such as wild rose (*Rosa webbiana*) and berberry (*Berberis vulgare*), are also found on the hill slopes around the arable land and in high pastures. Due to the scarcity of wood, most of these vegetation species are regularly collected for domestic needs and used as firewood for cooking and heating purposes (cf. Chap. 3.4.4.1 & 4.2.1.2).

According to the vegetation maps of the Eastern Hindu Kush (NÜSSER & DICKORÉ 2002), the treeless Torkhow valley shows characteristics of three vegetation classes, within an altitudinal range of 2,400 m to more than 4,000 m from the lower valleys up to the watersheds. These include arid desert scrub in the colline belt, semiarid to arid steppe and scrub in the montane belt, and semiarid scrub, thorn-cushion dwarf-scrub and steppe in the sub-alpine belts.

The lower Mehlp valley up to about 2,700 m with southern exposure is classified as arid desert scrub, with *Haloxylon thomsonii*, *Haplophyllum dubium* etc. This is a very narrow strip covering both sides of the main stream. The major part of Mehlp valley lies in different subtypes of the montane belt, ranging from arid and semiarid steppe to arid and semiarid scrubs. The representative vegetation includes *Arenaria griffithii*, *Daraba olgae*, *Juniperus semiglobosa*, *Krascheninnikovia ceratoides* and *Prangos pabularia*.<sup>17</sup> The latter is widespread in the whole Torkhow tahsil and is extensively used as a winter fodder. The northeastern and southwestern parts of the valley are considered to be sub-alpine belt. These are also small strips and consist of semiarid scrubs, thorn-cushion dwarf-scrub and steppe. The representative vegetation groups include different species of *Acantholimon lycopodioides* and *Astragalus lasiosemiis* etc. All plant communities are used for forage, fuel and fodder purposes (SAUNDERS 1983: 219; HASERODT 1989a:

<sup>17</sup> *Prangos pabularia*, locally known as *moshin*, is a perennial fodder plant and is commonly found in areas over 2,900 m a.s.l. (cf. Chap. 3.3.3.2).

138, 1996: 11; NÜSSER 2001: 246 and NÜSSER & DICKORÉ 2002: 51). Consequently, in some areas this has resulted in the disappearance and thorough degradation of the original vegetation cover (PEER 2000: 321 and NÜSSER & DICKORÉ 2002: 50).

To ensure the availability of firewood, fodder and timber at the household level, an integrated form of agro-forestry is extensively practised on the arable land. This applies not only to Mehlp valley, but also to other villages located in the treeless regions of the district (cf. HASERODT 1989a and MASOODUL MULK 1991, 1992). Within the cultivated area different species of poplar, willow and seabuckthorn are regularly planted and harvested every year. The newly reclaimed areas and relatively infertile arable land is usually given to irrigated plantations. In most cases, such plantation is combined with fodder crop and grass. In high altitudes above 3,500 m around the summer settlements, however, there is very little possibility of vegetation growth. This is because of extreme temperature conditions and intensive frost during the long winter season.

Both the natural vegetation and irrigated plantations are widely used for forage, fuel and fodder purposes. Timber for construction is exclusively obtained from the irrigated plantations. Due to the high altitude and unavailability of firewood, huge quantities of dung are also burned as a subsidiary fuel both summer and winter (cf. Chap. 4.3.3). Similar to the practices in Phander village of Ghizer district (cf. SAUNDERS 1983: 213 and BAIG 1994: 120), in the upper part of the valley firewood is commonly supplemented with a supply of turf or peat. The villagers cut the acidic grass into thick sections, which are then left in the sun for two to three months and stored for winter consumption.

## **2.2 Historical and Political Characteristics**

In addition to the physical characteristics that determine the availability, productivity and endowment of a settlement unit's natural resources, the entitlement to and utilisation of the essential resources are usually defined by political institutions. First of all, access rights and ownership regimes – once defined and implemented – are susceptible to changes and modifications with subsequent transformations in the political organisation. Moreover in the past, in the absence of any other material resources, possession of arable land and other natural resources was the only means of determining wealth. The whole population of the Eastern Hindu Kush was accordingly classified into different social groups based on the single criteria of land ownership. Thus the system of resource ownership, as well as access and utilisation rights of all natural resources, evolved as part of the political system in this region. In this context it is pertinent to discuss the evaluation and changes in the political organisation of Chitral, to highlight the relationship between political organisation and resource ownership, utilisation rights and land revenue.

### **2.2.1 Traditional System of Political Organisation**

Politically the study area is part of Chitral, which was a principality for more than five hundred years. It was ruled by hereditary rulers, locally known as *Mehtars*. The area was divided into administrative districts according to the physical layout, and various officials were appointed to carry out different administrative activities. Most of the officials

were recruited from the ruling aristocracy. The state officials had no regular salaries, but enjoyed many privileges in accord with their positions. They were allotted revenue-free land for cultivation (*jagir*, locally called *dur*), along with a number of families as non-paid workers to manage these estates (BIDDULPH 1880: 67; DURAND 1899: 100; STALEY 1969: 231; EGGERT 1990: 49 and ISRAR-UD-DIN 1995a: 151f.). Moreover, the officials were also entitled to withhold some of the land revenue they collected from their respective areas. Ultimately the *Mehtar* was the sole owner of all the land and other resources lying within the territorial limits of the state.

There were no rules for succession. Upon the death of a *Mehtar*, bloody skirmishes for the throne were common. His brothers and sons fought it out among themselves until all but one were killed or exiled. As a general rule, the neighbouring states wound up hosting the exiled members of the dynasty. On the accession of a new *Mehtar*, provincial and other officials were expected to transfer their allegiance. In some cases part of the hierarchy was defined anew: the *Mehtar* mostly selected his foster relatives as new officials, and redistributed the arable land and reassigned responsibilities among his supporters (cf. AZIZ-UD-DIN 1897; ROBERTSON 1898: 60; GURDON 1933; SHAH 1983 and STELLRECHT 1998a). Aside from arable land, the new *Mehtar* also gave water rights and alpine pastures as gifts to the influential clans and his own relatives (STALEY 1969: 233).

In the following text, the political ecology is discussed mostly in reference to resource ownership, taxation and reforms. To achieve these objectives the political history has been simply divided into four periods: Feudalism (pre-1895), Colonial Period and Indirect Rule (1895-1947), Independence and Transitional Period (1947-1969), and the Modern Period (1969 to present).

## 2.2.2 Feudalism: The Mehtar Period up until 1895

During the period up to 1895 the state was ruled by *Mehtars* from the Raisay and Katoray dynasties. The whole state was divided into administrative districts, which the ruling *Mehtar* gave to his sons and brothers to administer.

A group of local elite supported the ruling family, and the majority of the lower administrative personnel were selected from among them, mostly on a hereditary basis.<sup>18</sup> Changes in regional political constellations and allegiances with neighbouring powers had very little effect on the internal administration of the state. The system of governance was through regular *mahraka* (*darbar*), which was convened twice a day (YOUNGHUSBAND 1896; AZIZ-UD-DIN 1897; DURAND 1899; and ISRAR-UD-DIN 1965).<sup>19</sup>

<sup>18</sup> Even the lowest unofficial ranks and communal responsibilities at the village level were hereditary (STALEY 1969 and SHAH 1983). For example, even the watchman (*mer zhoi*) of the main irrigation channel in Khot valley (*ra zhoi*) used to be selected from the influential clan (ISRAR-UD-DIN 1992a, 2000; BAIG 1997).

<sup>19</sup> However, according to ISRAR-UD-DIN (1965: 54) “[...] during the British rule, these sort of *darbars* became more and more formal and the common people had less opportunity to reach the ruler.”

The exact number of persons responsible for carrying out state jobs during this period is not precisely known, as no written records are available before the colonial period.<sup>20</sup>

In the absence of any monetary form of economy, **land ownership** was the main yardstick for social hierarchy, and the *Mehtar* commonly gave arable land to his supporters as a token of reward. This system created three different social structures at a single village level: the royal family as the real and ultimate owners; the upper class (*adamzadas*) as landlords/owners; and the majority of the population as tenants. BARTH (1956a: 81f.) described the system as follows:

*“The whole state was organized through an association of specific duties and responsibilities with particular areas and plots of land. As land was the only source of wealth, all persons could thus be categorized in terms of the duties associated with the particular fields of land that they were utilizing. All land belonged, in the final instance, to the Mehtar (literally: «owner»), and the duties associated with any specific piece of land were to be regarded as payment, in service or produce, for temporary usufruct (Sic!) rights to that land. [...] The estates were inherited from father to son, or in lieu of sons by another the maintenance of travelling officials of the state or the Mehtar and as the ultimate owner of the land he had the right (and often the power) to evict anyone at any time. (Sic!) [...] These duties could be wonderfully specific and complex: one field required the payment of no more than one goat and seven chickens to a travelling official no oftener than semi-annually, the next was associated with the duty to keep the Mehtar’s own fields free of crows, the third with catching and training hawks and falcons for the Mehtar, a fourth with one month’s labor pr. Year etc. Furthermore, a complex pattern of sub-infeudation was developed, whereby each larger estate was again subdivided and leased out as a miniature of the state system, but with duties to the estate-holder and not to the Mehtar.”*

The revenue collection system was also complex and without proper assessment. The elite group (*adamzada*) was exempted from the payment of revenue, however they were assigned some responsibilities. All state revenues were paid by the *fakir miskin* class.<sup>21</sup> The revenues were paid in kind to the responsible authorities of the respective administrative units, who then retained their own share (*ishpain*) before submitting the rest to the ruler. The *fakir miskin* were the backbone of the state economy. Without receiving any incentives from the upper classes, they worked on the state land as state tenants (*ra-yat*) and on the land of the *adamzada* in different capacities, such as *dehqan*, *shirmuzh* or *khanazat* etc. The elite groups (*adamzada*), on the other hand, were a huge burden

<sup>20</sup> Information on the number of state officials along with their respective duties is available from colonial and other historical sources. However, there are many discrepancies and much overlapping in the division and distribution of responsibilities among the officials. For more details see BIDDULPH (1880: 66f.); AZIZ-UD-DIN (1897: 35ff.); GENERAL STAFF INDIA (1928: 70); IOR/2/1077/235/11826/212-213; BARTH (1956a); ISRAR-UD-DIN (1965: 56); STELLRECHT (1980: 226ff.); HASERODT (1989a: 49) and EGGERT (1990: 102ff.).

<sup>21</sup> The term *fakir miskin* has a colonial origin and is unknown to the local inhabitants of Torkhow and Mulkhaw tahsils of Chitral (cf. EGGERT 1990: 60). It consists of two words in the Arabic language, and literally means a “beggar and destitute person”. According to FAIZI (1996b: 61), *fakir miskin* has been used as a substitute for *shirmuzh* and *ra-yat* classes.



on the poor economy of the state: as a land-owning but non-cultivating aristocracy (HUSSAM-UL-MULK & STALEY 1968: 93) in an entirely agricultural economy, they were an unfavourable role model for the general public.

Other natural resources were distributed by the *Mehtars* as favours in the same way as arable land. The rulers commonly granted pastures and allocated irrigation water to the influential clans and close relatives (ISRAR-UD-DIN 1992a; BAIG 1997 and FAIZI 1999). This created two different user groups at the village level, with different access and utilisation rights, i.e., real owners (*miras khour*) and users (*dasture khour*) (cf. BAIG 1994: 119; ISRAR-UD-DIN 1995b and FAIZI 1999). The common people also had usufruct rights over the nearby pastures for livestock grazing, fodder and firewood collection. The main watercourses and high pastures (locally known as *shotar*, *gharil gol*) were reserved for the ruling family and local nobility as game areas for seasonal migrating fowls and local game. Nevertheless, this dichotomy in resource ownership and utilisation did not – and still does not – exist in Mehlp valley.

Aside from land revenue, there were other sources of income for the *mehtars*, such as the sale of timber, grazing taxes levied on *gujurs* and the minority population of the state etc. Taxation on trading and selling of the lower-class families in the slave market was also a major source of income (BIDDULPH 1880: 67; LOCKHART & WOODTHORPE 1889: 266; AZIZ-UD-DIN 1897; ROBERTSON 1898: 58f.; DURAND 1899: 51,52 & 76; ISRAR-UD-DIN 1965: 49; and STELLRECHT 1998a: 52). The following observation of BIDDULPH on the taxation system and revenue collection of the state clearly highlights the irregularities of the system and the exploitation of the lower class.

*“The regular revenue of the country is paid solely by the ‘fakir mushkin’ [miskin] class. Those who live by agriculture are assessed at a tenth of all produce, one sheep, one blanket, and 20 lbs. of honey from each house yearly. The pastoral community is assessed at four sheep, three woollen robes, and 30 lbs. of butter from each house yearly. A few villages, which are almost entirely employed in mining, pay 16 lbs. of mine produce yearly for each house. There is, however, very little regularity observed in collecting these imposts, and, in practice, as much is wrung from the subject population as possible. Considerable dues are collected from the merchants who trade between Badakhshan and the Punjab, and the Chitral ruler’s revenue is further increased by the sale of hawks and falcons, of which great numbers are captured every year and sold to merchants, who take them to the Punjab.”* (BIDDULPH 1880: 66)

In the absence of regular and safe transportation routes connecting the state with the neighbouring countries (MONTGOMERIE 1872: 183), other sources of income were not secure and, since they were collected in kind, they were also difficult to estimate.<sup>22</sup> The timber trade was carried out by floating logs in the Kunar River during the high discharge period (summer). Timber merchants from the lowlands mostly plied this trade, especially the Kaka Khel Mians from Peshawar district (GURDON 1936: 30).<sup>23</sup>

<sup>22</sup> According to AZIZ-UD-DIN (1897: 38f.), the biannual land revenue that was forwarded to the Mehtar by the respective governors was: ca. 2,000 woollen robes, 14,000 maund of grain (one maund = ca. 37 kg), 300 maund of butter and 4,500 head of sheep.

<sup>23</sup> Cutting of trees and transportation of logs were always organised through forced labour (cf. DURAND 1899: 76).

They had also a monopoly on the mineral resources of the state (MCNAIR 1884: 14). In regard to other trade items, the exports of the state were negligible; the state capital, Chitral, functioned rather as a stopover between the trade centres of the time, which were mainly located in present-day Afghanistan. As a result, good political relations with Afghanistan were important not only for the timber trade, but the whole trade via this route depended on it (CURZON 1926: 134; COBB 1951; ALDER 1963: 148; BAIG 1990; KREUTZMANN 1998a, 1998c and STELLRECHT 1998a).

The state had no organised system for constructing and maintaining infrastructures; rather, all construction and repair work was done by forced labour. Every household from the *fakir miskin* class was compelled to visit the capital for a certain period of time many times a year to perform state duties; in times of war they were forcibly dragged to it. Members of the *fakir miskin* class were not allowed to travel outside the state. The social status of the majority of the population was practically no better than that of purchased or captured slaves, and the *adamzada* were against any changes in the system that would favour the poor masses. The rulers themselves were virtually unable to implement any reforms in the state, because they were always at risk, vulnerable to the changing allegiances of the upper classes. To save their life and further ensure their throne, they were actually playing into the hands of the local aristocracy (ISRAR-UD-DIN 1965).

The general practice of confiscating agricultural land from the poor farmers was common throughout the state. The poor people were relocated from village to village and their land was given to influential persons. When a person died, the agricultural land under his supervision was mostly added to the state land or given to notables. This system persisted throughout the history of the state, continuing even during the colonial period.<sup>24</sup> The British authorities were no more than simple observers to these injustices and one-sided decisions of the *Mehtar*.

### 2.2.3 Colonial Period and Indirect Rule 1895-1947

The Chitral-Kashmir treaty of 1879 brought the state under the indirect control of the British; the state thereby accepted Kashmir suzerainty. The overall authority regarding resource ownership and governance systems remained predominantly the same. The major change was the exemption of Laspur valley from land revenue and other state services.<sup>25</sup> In fact, with the external support of the British, the local ruler became stronger (cf. EGGERT 1990: 101f.). To widen the spectrum of land revenue, a new and regular

<sup>24</sup> "His Highness [the Mehtar] in contravention of clause 7 of the agreement [Mastuj Agreement of 1914] suddenly took away some land belonging to about 27 families in Onshit in the Mastuj province and gave it to the hakim of Laspur... the arbitrary confiscation of land purely to show his power or please some favourite..." (IOL/P&S/12/3286/1607/4). Moreover, for more than the last 50 years litigations over land that was confiscated and re-allotted within the royal family are still pending in the courts, waiting for rulings. (THE DAWN, October 16, 2002 & THE FRONTIER POST, October 16, 2002).

<sup>25</sup> The colonial authorities awarded this exemption in recognition of and reward for the services of the Laspur people in 1895. This was also made a clause [3] of the Mastuj agreement in 1914 (IOL/P&S/12/3286/1607/5 Mastuj Agreement 1914 and GENERAL STAFF INDIA 1928: 68).

tax on land produce was introduced – 10 percent of the total land produce (*ushur*). This tithe was imposed on the whole population, with the exception of the inhabitants of Laspur valley and the Kalash minorities of Kafiristan. Initially this new system was introduced under the pretext of conforming to Islamic laws, and the local theologians were consulted.<sup>26</sup> After its successful promulgation, however, the compulsory tithe became another source of revenue for the state. The tax was collected as prescribed by the Islamic law, but was never spent accordingly (LOCKHART & WOODTHORPE 1889: 266f.; ISRAR-UD-DIN 1965; BAIG 1990; and EGGERT 1990: 109ff.).<sup>27</sup> Later on, the method of collection and storage of *ushur* was streamlined<sup>28</sup> and regular contractors were selected to collect the tax from the households in their respective areas.

In practical terms, the colonial power did not do much for the welfare of the local population during their five-decade reign. The only improvement that occurred during this period was a decrease in the slave trade – but this can also be attributed to changing political relations and the internal political situation in the former slave markets, and not necessarily to the intervention of the British authorities (CURZON 1926: 134). Of course, the local rulers became more peaceful (cf. AZIZ-UD-DIN 1897), but the forced labour increased manifold.<sup>29</sup> Only the *adamzada* were eligible to enter the local militia, which was raised under the name *Chitral Scouts*. Moreover, the informal *durbars*, which were held twice a day to settle different cases, became overly formal, and it became practically impossible for the common men to reach the ruler (ISRAR-UD-DIN 1965: 54). The British were content with the status quo and did not try to lessen the common people's burden, even when they became the real rulers of the country after 1895. They did not bother to change the system of land revenue and resource ownership.

<sup>26</sup> Zakat is the second most important obligation of Islam, after prayer. The amount is payable every year, based on land produce and cash savings, as well as gold and silver ornaments. The percent of land produce to be levied varies according to the irrigation system. In rain-fed areas 1/10 or a tithe (also called an *ushur*) of the product is paid, whereas in the canal-irrigated areas 1/20 of the whole product is given to the needy people. Since the whole Chitral district is arid and depends indirectly on yearly precipitation, it is therefore placed in the category of rain-fed area. Only 2.5 percent of cash assets is due every year, and the amount of zakat paid on gold and silver ornaments is determined according to weight, and is also payable on a yearly basis.

<sup>27</sup> EGGERT mentioned two new taxes – sauring and utakh – in addition to the popular ones reported in the colonial records and other sources. The sauring tax was to support the British travellers and officials, and the utakh was imposed on the inhabitants to support the [local] officials on tour (cf. Tab. 2.3). Both were organised as forced labour. For more details on the functioning and organisation of forced labour for porter services at region scale see MACDONALD & BUTZ (1998). For additional information on administrative-area-based collection of revenue, see also IOR/2/1077/235/11826/214-213.

<sup>28</sup> "In about December 1937 His Highness the Mehtar of Chitral introduced a new procedure for the collection of USSHAR, i.e. revenue of 10% of the crop, from his people. The previous practice was that the USSHAR was collected together in the fields and the Mehtar's officials manage to clear it to his highness' godown. The order now issued requires the peasants to take it direct to the godowns." (IOL/P&S/12/3295/1033/320).

<sup>29</sup> "Now and then owing to the press of work in the lower districts in connection with the collection of fodder for the relief's and the construction of irrigation cuts, it has been found necessary to give the people of the larger districts, vis., Mulikho and Turikho an extra turn on levy duty" (IOL/P&S/7/136/1065)

The overall situation during the five decades of British rule was regretfully stated by SCHOMBERG as follows:

There are some excuses for the Chitrali. As I have pointed out he receives no leading and no encouragement from the ruling or upper classes, who prey on him and besides set a bad example. The peasant is a helot. No one cares for him, let him live or die so long as he contributes his quota to the State which has never done any thing to benefit him, and I suppose never will. It is regrettable that forty years of British occupation have done nothing or next to nothing to ameliorate the lot of the great bulk of the population. A great opportunity has been deliberately missed. The land tenure is bad and this reacts on the peasants. There is no incentive to plant orchards, extend the arable, or improve the crops when another may enjoy the fruits of the worker's toil. Thus a great deal of hardship and preventable poverty is encouraged by this faulty system of tenure. Every Chitrali is an occupancy tenant only. Legally, if unjustly, he can be told to clear out at any movement. Why this was not changed when the British occupied the country in 1895 is a mystery. (SCHOMBERG 1938: 219f.)

Another important feature of this period was out-migration. Considerable population movement was caused by the *Mehtar's* notorious religious prosecution of the *Ismaili* or *Maulai* community of upper Chitral during the 1920s.<sup>30</sup> Many families left their houses and properties and fled to the neighbouring regions.<sup>31</sup> Some of the families were repatriated through political pressure from the British authorities, but most settled outside the state. Another cause of out-migration was the fact that, throughout the recorded history of the Chitral State there were no rules for succession. It was a common practice among the potential heirs of the 'blood-strained Takht' (STEIN 1921: 35) to go into self-imposed or forced exile (cf. AZIZ-UD-DIN 1897; BAIG 1996: 144 and STELLRECHT 1998a: 49) after every new succession, to save their lives (cf. Chap. 2.2.1). Even today, the repatriation of these refugees and exiled families is a political theme discussed in the newly established district assembly: "The meeting also supported re-entry of those 53 families, who, despite being inhabitants of Chitral, were not allowed to enter the district by the *Mehtar* of the defunct state. After their expulsion, these families had been living in misery in different areas and had lost their socio-economic status due to their displacement ..." (THE DAWN, July 30, 2002).

The British authorities also undertook very little development of infrastructures. The roads and footpaths mostly remained in the same state, and the total length of road negotiable for motorised traffic was only 65 km. Travelling time between the two parts of the state was about three to four days. There were only two garrison hospitals functioning in the whole state. The first major reform was initiated by one of the local rulers, who, despite the opposition of the local aristocracy, founded a school in the capital area in 1937. The upper-class families sent their children to the lowlands of British India to be educated, and they were not willing to give any opportunity to the poor people.

<sup>30</sup> For further information on the *Ismailis* of the Hindu Kush see NASR-UL-MULK (1935).

<sup>31</sup> There are many historical reports on the *Maulai* or *Ismaili* situation under the religious persecution of the *Mehtar* during this period (IOR/2/ 1079/244/2). They mostly fled to Ghizer and Yasin valleys (IOR /2/1079/244/24), and according to FAIZI (1996b: 84), "Hundreds of thousands of Ismailis fled to Gilgit, Badakhshan and Wakhan."

## 2.2.4 Independence and Transitional Period 1947-1969

With the partition of British India, a new era started in this principality. The then ruler Muzaffar-ul-Mulk entered an accession with Pakistan. Chitral State became a constitutional monarchy, partially administered by the central government through an assistant political agent, locally known as *wazir-e-azam*. In this period, following a successful political movement, some reforms in the revenue and taxation system were introduced. In 1953 among others the most unpopular taxes were immediately abolished, including *thangi*, the “sheep tax,” along with *corvée* and the system whereby the villagers and *adamzada* clans had to provide free sustenance for the *Mehtar* and his retinue (*ashimat*) (IOL/P&S/12/3284/8121 1949 and ISRAR-UD-DIN 1965, 1967). Regular records of state income and expenditure were kept, and the state officials were paid in cash for their services, instead of grain. For the first time in the history of the state, people were paid for their work (ISRAR-UD-DIN 1967: 43). Various departments were established to carry out development works. Recruitment into the police and Chitral Scouts was opened to the poor people, and eligibility was no longer determined by social hierarchy, but was based on personal merit. The general laws restricting movement of the common people outside the state boundaries were also relaxed. New schools were established, and footpaths were constructed and extended to the main administrative centres. To enable extension of cultivated areas, new irrigation channels were constructed in many parts of the state. Hospitals and dispensaries were established in different parts of the state, and the total length of jeepable roads in the state increased to more than 270 km. All this development work was carried out with financial help from the central government, and state resources were also utilised to create better living conditions for the general public.

The overall process of development was rapid. However, there were difficulties for completing some of the plans and anticipated development works in a timely manner due to lack of experience as well as financial constraints. Some of the schemes either never materialised or totally failed, and the general public reacted with frustration. Remote areas of the state remained disconnected and faced problems in finding an efficient means of communication. The traditional system of maintaining and repairing the village infrastructures became weak, and the government was increasingly expected to carry out this type of work. Early researchers made the following observations on this ‘negative development’:

Certain other attitudes and tendencies of the people are worth noting. The dependency of the people on the government aid for such problems, which were and could now be solved by the individuals or villagers themselves is growing more and more. Such cases are not only creating a great burden on the state economy but are also severely hindering other works of priority. This also endangers the long established system of communal labour and self-help, which would thus die its unnatural death and the country would have to pay a large price for that. (ISRAR-UD-DIN 1967: 51)

In general, the common people were released from the burden of state duties and exploitative taxes. The only payment that was expected from them was *ushur*. However, the ownership of resources remained the same, and the ruling family received more arable land in the newly reclaimed areas. Some reforms were made in the local tenancy

system. The tenants-at-will were given a certain amount of land-produce after their payment of *ushur*. According to HASERODT (1989a: 112) they were given 60 percent of the total land produce. No changes occurred in the positions of *shirmuzh* or *khanazat* etc. The prevailing uncertainty in land tenure discouraged the average farmers from carrying out long-term improvements to their possessions. This became a main hindrance, especially with regard to planting trees in the remote and high-altitude villages, where vegetation needs a relatively long time for growth and maturation.

### 2.2.5 Modern Period from 1969 Onwards

This era has witnessed a lot of changes in the socio-economic and political structure of the newly created district. The pace of changes has been very rapid and unprecedented in the history of the area. In July 1969, the principality of Chitral was merged with Pakistan as an administrative district of the Malakand division, North West Frontier Province. New line departments were established and a new administrative system replaced the old one, which had been implemented after the 1953 reforms. In this context, the federal government decided to validate the existing land ownerships and to exempt old land transactions from court litigation. This was a great relief to the majority of households in the newly created district, as the process of land confiscation and displacement of households had been a common feature of life, and had persisted for centuries as part of the local rule. In 1972 the feudal system was finally totally abolished, and the people working the land became de facto owners of the arable land that they had cultivated as state tenants for generations (cf. MASOODUL MULK 1991: 27). The regular collection of *ushur* by the state authorities was also stopped. The farmers have not stopped paying it; however it now goes to the needy neighbours and relatives as a religious obligation, and not to the state.<sup>32</sup>

The old patterns of land and natural resource ownership have persisted without any drastic changes, despite land reforms undertaken by military and democratic governments at the national level. The existing system has become ever more complex, embracing the new developments and extensions of arable land sprouting up within the village limits. Nevertheless, the former rulers and nobility still have control over the pastures and other important resources. For example, the alpine pasture of Shah Jinali in Torkhow tahsil is still under the de facto ownership of the influential clan of the area. Likewise, most of the river courses (*shotar*) that have sufficient space for hunting migratory birds are still a cause of dispute between the royal family and the nearby villagers.<sup>33</sup>

<sup>32</sup> During the 1980s new *zakat* committees were constituted throughout the whole Pakistan. The members were elected by democratic process for three-year terms and were responsible for collecting *zakat* from the households of their respective constituencies, as well as disbursing the funds or agricultural implements allocated to them from the high officials. The local communities were no longer forcibly compelled to pay *zakat* as they were prior to 1972.

<sup>33</sup> In most parts of the district, small artificial ponds are made along the main river to attract the seasonal migratory waterfowl. Locations for hunting waterfowl are Kalkatak, Balach, Jinali Kock and Shagram. The access to these sites and resources still causes problems between the common people and the former ruling family and other notables. The local villagers living close to river courses get access to these resources through displays of physical strength. In the case of other resources, such as pasture, the local villagers have some secondary rights that are accepted by the royal family and other influential clans living in the village.

The royal family also still holds its control over many high pastures in different villages of the district (HASERODT 1989a: 112 and NÜSSER 1999: 120).<sup>34</sup>

Similar to the situation in former principalities in the northern mountainous belt of Pakistan (cf. KREUTZMANN 1988, 1993a, 1993b and KHAN & HUNZAI 2000), the collapse of the former dynasty created a political vacuum in the organisation system in Chitral district (ISRAR-UD-DIN 1967 and MASOODUL MULK 1991), which the newly appointed state officials were unable to fill. Moreover, the newly implemented land reform caused litigation over both common-pool resources and arable land throughout the district. In the case of common resources, the conflicting parties were neighbouring villagers, who were competing for access rights and to legitimise new boundaries. In the case of the arable land, former tenants of the royal house and landlords refused to pay their due share to their landlords and went to court to sue for ownership of the arable land under their possession. These litigations had very strong repercussions on the traditional system of tenancy, putting stress on the old and well-established relationship between landlords and tenants throughout the district. Though most of the cases have now been settled, many cases are still pending in different courts, awaiting judicial verdict.

At the village level, the litigation that ensued at this time of political transition from feudalism to democracy, with its promulgation of new laws, was similar to what occurred throughout the whole district (ISRAR-UD-DIN 1995a: 165f. and FAIZI 1999: 15). From the 1970s through the 1990s the individual villages within Mehlp valley again entered court litigations, both with each other and with the neighbouring villages outside the valley.<sup>35</sup> The main objective of these litigations was to get legal access to the pastures and their resources, and to realign pasture boundaries. Due to delays in court verdicts and the unavailability of sufficient proofs in favour of or against the claims of conflicting parties, most of the litigations ended without any new result. The traditional patterns of utilisation and access rights were once again restored (cf. Tab. 3.7). In only one case a village (Shoat) was granted some legal rights to the pasture resources of another, but in reality they were granted much less than what they had demanded.

In certain cases, other factors also contributed to the people's attempts to manipulate the traditional ownership of pasture resources and to legitimise the old ownership pattern for future use.<sup>36</sup>

<sup>34</sup> Unlike this general trend, in some cases the individual villages also own most of the alpine pastures (SNOY 1993: 59). They utilise these pastures for grazing livestock and regularly collect taxes from the nomadic *Gujurs*, e.g., in Jughoor Gol (cf. HASERODT 1989a: 133). Similar practices have been reported from Kohistan. For more details see BARTH (1956a & b).

<sup>35</sup> A similar situation with its accompanying heavy expenditure on litigations has been reported from Hunza valley. For further details see KREUTZMANN (2000a: 106ff.).

<sup>36</sup> In 1990 the inhabitants of upper Mehlp refused to take care of the Rayeen villagers' sheep and goats. Then the Rayeen villagers blocked the jeepable road, then tried to build a seasonal settlement in the pasture very close to Mehlp village. The residents of Mehlp resisted strongly. Consequently the Rayeen villagers went to court and sued for legal access-rights to one of the pastures in upper Mehlp. The litigation lasted for eight to nine years. Eventually the Mehlp villagers won the case. Therefore, according to the land reforms of the 1970s, they could use it for grazing and for the collection of other products thereof, i.e., fodder and firewood.

This state of affairs has had a very bad impact on the available natural resources. The scarce forest resources of the neighbouring village have become degraded to a great extent, and the de-facto owners are no longer interested in guarding it as vigilantly as in the past. Forage resources for goats and sheep are now becoming a bone of contention among the villagers, and conflicts with shepherds hired by the neighbouring villages have become common, especially in Odier. These conflicts arise because the hired shepherds are not familiar with the traditional systems and are grazing the sheep and goats in a more flexible and relaxed manner.

Many researchers have recommended land settlements to avoid all these ownership-related problems and to give legal protection to the existing property rights throughout the whole district (cf. MASOODUL MULK 1991 and FAIZI 1999). The newly elected district government is seriously considering this issue, despite public opposition and financial difficulties (THE DAWN, July 31, and August 20, 2002). If this process is initiated without properly acknowledging the traditional utilisation system and the prevailing customary laws, it could create large-scale conflicts both between the state and the communities and among the neighbouring villages. Furthermore, it is quite urgent to settle all the land disputes in the district before formally accepting and conferring legal rights on the owners/occupiers. In regard to the usufruct rights of common-pool resources, such as pastures, grazing land and irrigation water, it is likewise crucial to save the time-tested traditional system of common-property resource management. The procedure adopted in the 19<sup>th</sup>-century land settlements in the Karakorum and Himalayas can be followed as a reliable model here (cf. SINGH 1917 and COWARD 1990).

Another important landmark of the 1970s was the arrival of subsidised food items to the remote villages. Supplies of sugar, cooking oil, wheat and kerosene oil were made available to all the inhabitants at subsidised rates. In addition, road networks were extended to the more remote parts of the district. The tahsil headquarter of Torkhow, Shagram was connected with a jeepable road in 1978. After a decade most of the side valleys also became accessible to motorised traffic through government-financed projects, NGO efforts and self-help initiatives of the villagers (see below). Health facilities, schools, higher-level educational institutions and hydroelectricity power stations were established at the administrative centre of the district and other localities.

Soon after the abolition of the former state in the 1970s, new schools were established in Mehlp valley. At present, there are three primary schools and one middle school for boys. In the 1990s the state established two additional primary schools for girls and a small dispensary. The community has also opened two full-day religious schools (*madrasa*) for both boys and girls in the valley.

This access to education and new ideas, as well as the increased physical accessibility and resultant mobility of the people has changed the whole socio-economic system in the district. Both seasonal wage-labour migration during the winter season and educational migration have increased considerably. Most of the migrants belong to disadvantaged remote villages, where they are unable to get suitable jobs in the government services for a variety of reasons. Moreover, dependence on exogenous food supplies and the resultant transformation of the village economy have considerably increased seasonal and long-term labour migration both to the lowland and abroad (cf. Chap. 5.5.2).



Since the late 1980s non-governmental organisations have also started working in the area. The Aga Khan Rural Support Programme (AKRSP) started its activities in 1986 with the establishment of so-called village organisations (VOs). They initiated local-level infrastructures, such as link roads, irrigation channels and micro-hydroelectricity projects, in many villages of the district. Although the *Sunnis* and *Shias* population of the programme area, from Baltistan in the east to Chitral in the west, were (and still are) relatively sceptical of the activities of this NGO, it has nevertheless made substantial progress in persuading the masses and advocating a participatory approach to rural development (cf. Chap. 5.6.1). The physical infrastructures – notably link roads and irrigation channels and later on the village-based micro-hydroelectricity project – have become very popular and successful.

During the 1990s another non-governmental organisation, the Chitral Area Development Programme (CADP), was established in the district for a relatively short time with the financial support of International Fund for Agricultural Development (IFAD). The main achievements of CADP were the establishment of an agricultural research station at Chitral town and the construction of an all-weather road from Chitral to Booni. So with the help of both government and non-governmental organisations the remote villages got electricity and access to motorised roads. The improvement and extension of old irrigation channels, as well as construction of new ones, by these NGOs increased the amount of arable land in the district substantially.<sup>37</sup>

## **2.3 Demographic Dynamics and Social Characteristics**

### **2.3.1 Population Growth in Chitral District since 1899**

The most important feature of the population of Chitral is its unprecedented growth from 1900 onward. It must be noted, however, that the available village-level data lacks consistency and accuracy, and did not even begin to be adequate until the 1981 census. Thus it is very difficult to make comparisons based on this incomplete and inaccurate data. The first regular census was carried out in the whole state in 1961. Although more information from already published sources, such as old gazetteers and colonial reports, were added to the census report (GOP 1961), the names of the villages listed at the end were inaccurate and are thus unintelligible even for a local person (App. 6). The reasons for the inaccurate enumeration up to the 1961 census have already been discussed in detail (cf. ISRAR-UD-DIN 1969, 1971).<sup>38</sup> The village listings did not improve in the population census in 1972. This time the neighbourhoods of the individual villages were joined and thus listed at the end of the census report. In some cases the neighbourhoods of one village were divided among three other villages, making it almost impossible to ascertain population figures for a single village – at least in the case of Chitral district (cf. HASERODT 1989a: 104) (App. 7). The remaining two censuses of 1981 and 1998 were better with regard to the enumeration and listing of villages, and contained population figures at least for Torkhow tahsil. The number of villages listed in these two censuses

<sup>37</sup> For further details on the activities, constraints and achievements of the NGOs see Chap. 5.6.

<sup>38</sup> Different demographic aspects and characteristics of Chitral district for the census year 1981 has been discussed by ANWAR-UI-HAQ & IJAZ (1996).

was identical and thus village-specific data analysis became possible.<sup>39</sup> Regarding age structure and composition, no separate data is available at the tahsil level.

Population data is available for Chitral district for more than one century. Between 1899 and 1998 the population of the district increased more than six-fold, from 48,740 to 318,689 persons (Tab. 1.2). Since 1961 the average annual growth rate of the district has been greater than the overall national average. However, from 1981 to 1998 the average annual growth rate of the district remained below 3 percent. The district has a predominantly rural population. According to the census of 1998, more than 90 percent of the total population was rural, and resided in 643 villages varying in population from less than 200 to 4,999 inhabitants. (GoP 1999: 61). The only urban centre was Chitral town (the administrative headquarters), with a population of more than 30,000 persons.

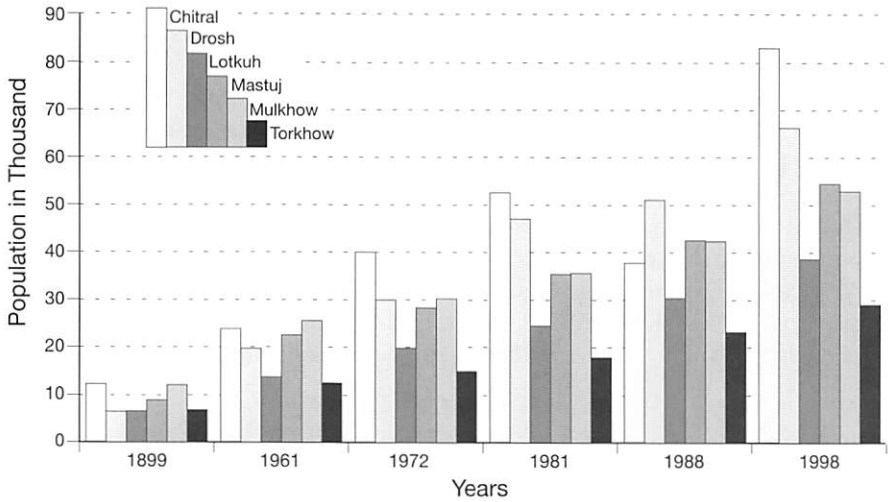
**Tab. 2.2 Population Growth in Chitral District (1899-1998)**

| Tahsil/Year  | 1899          | 1912          | 1941           | 1951           | 1961           | 1972           | 1981           | 1988           | 1998           |
|--------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Chital       | 11,587        | n.a.          | n.a.           | n.a.           | 22,865         | 39,182         | 51,695         | 36,878*        | 82,177         |
| Drosh        | 5,634         | n.a.          | n.a.           | n.a.           | 18,962         | 29,303         | 46,324         | 50,158         | 65,314         |
| Lotkuh       | 5,836         | n.a.          | n.a.           | n.a.           | 13,017         | 19,132         | 23,622         | 29,542         | 37,383         |
| Mastuj       | 8,162         | n.a.          | n.a.           | n.a.           | 21,616         | 27,556         | 34,645         | 41,770         | 53,661         |
| Mulkhov      | 11,290        | n.a.          | n.a.           | n.a.           | 24,788         | 29,409         | 35,022         | 41,543         | 51,928         |
| Torkhow      | 6,231         | n.a.          | n.a.           | n.a.           | 11,809         | 14,422         | 17,252         | 22,360         | 28,226         |
| <b>Total</b> | <b>48,740</b> | <b>80,207</b> | <b>107,906</b> | <b>105,724</b> | <b>113,057</b> | <b>159,000</b> | <b>208,560</b> | <b>222,251</b> | <b>318,689</b> |

\* Chitral Town is excluded from Chitral Tahsil. n.a. = data not available.

Sources 1899/1900 Intelligence Branch, Division of the Chief of the Staff, Army Headquarter, India (1907): Frontier and overseas expedition from India 1. Tribes north of the Kabul River. Simla, p. 80 (App. A) (Author's own calculations). 1912: GENERAL STAFF INDIA (1928): Military Report and Gazetteer on Chitral. Calcutta, p. 38. 1941, 51, 61: Ministry of Home and Kashmir affairs, Office of the Census Commissioner. Population Census of Pakistan 1961, Census Report, Karachi: III-12/13. 1972: Ministry of Interior, State and Frontier Regions, Census Organization: Population Census of Pakistan 1972, District Census Report of Chitral, Islamabad, 1976. 1981: Government of Pakistan, Population Census Organization: District Census Report of Chitral, Islamabad, 1983. 1998: Government of Pakistan, Population Census Organization: District Census Report of Chitral, Islamabad, 1999. Government of NWFP Planning and Development Department (ca. 1988): District Census of Rural Settlements 1988. Vol. 2 Chitral, Peshawar.

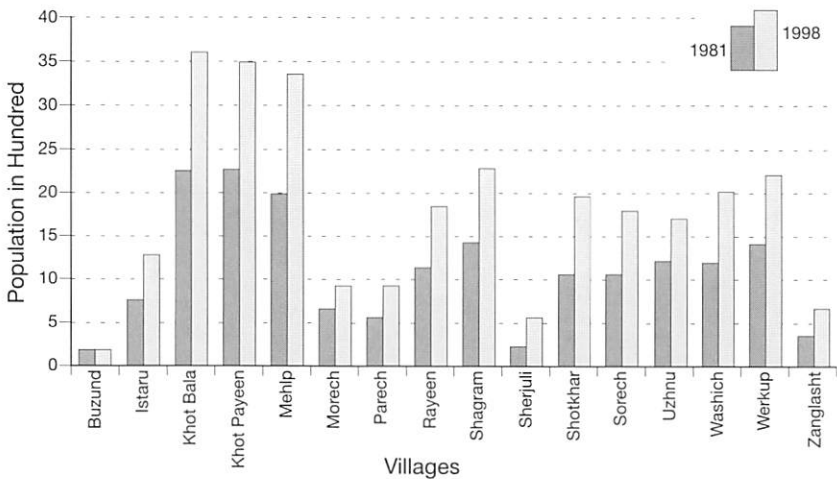
<sup>39</sup> In the last census (1998) more information on the districts was added to the district census reports, including maps of the tahsil. Still, many inaccuracies can be found. For example, in the introductory section of the census report of Chitral district, under the topic of 'languages spoken,' it is mentioned that "Wershik war [Brushaski] is spoken in upper Chitral (Warshigum and Yassen areas)" (GoP 1999: 24). Actually Warshigum and Yasin are not part of Chitral. Moreover, in the case of Chitral district, very little information is shown on the attached maps, except boundaries and streams.



Source Tab. 2.2

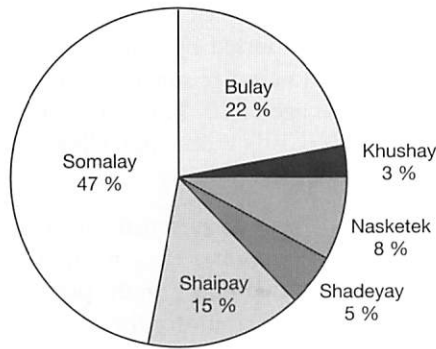
**Fig. 2.2 Chitral: Tahsil-wise Demographic Development (Selected Years)**

The situation in Torkhow tahsil was different than the general trend observed in the district. From 1899 to 1998, population growth in Torkhow tahsil was relatively low compared to other tahsils. Its share in the total population of the district decreased from 12.78 percent in 1899 to 8.86 percent in 1998 (Fig. 2.2). Nevertheless, during the last two censuses of 1981 and 1998, all villages of Torkhow tahsil except one gained in population (Fig. 2.3). This can be mainly attributed to natural increase (more births and fewer deaths). Likewise the population of Mehlp valley increased from 1,953 to 3,322 persons, with an average annual growth rate of over 4 percent, whereas the population growth figures for Chitral and Mastuj subdivisions were much lower during the same period – 2.49 and 2.57 percent respectively (GOP 1999: 59).



Source Gop 1983, 1999

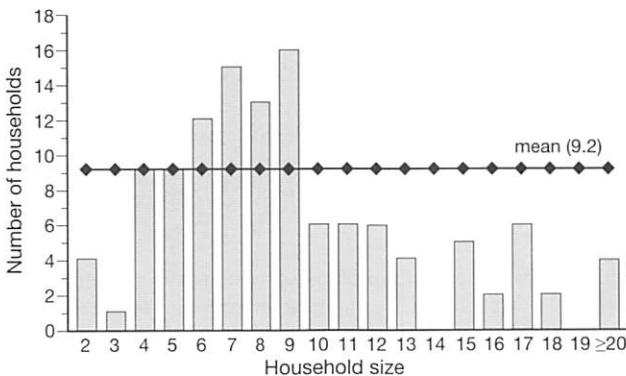
**Fig. 2.3 Torkhow Tahsil: Village-wise Population Growth (1981-1998)**



Source: Author's own survey, 2001

**Fig. 2.4 Odier: Clan-wise Population Distribution 2001**

The population of Odier increased more than 12 times, from 85 persons in the 1920s (GENERAL STAFF INDIA 1928: 262) to 1,100 in 2001 (own survey). According to the author's field data the village had a predominantly young population: at the time of the survey more than half (52 %) of the total population was less than 15 years old. The average number of children per household was about 4.7, with a maximum of 15, and there were slightly more girls than boys (cf. App. 1.3). Of the six clans in the village, the Somalay were in the numerical majority with 47 % of the total population, followed by Bulay, with 22 % and Shaipay, with 15 %. The remaining three clans collectively had less than 20 % of the total population (Fig. 2.4). The average household size was over 9 persons, which was also more than the district average of 7.9 persons (GOP 1999: 59). In this village the number of household members varies from a minimum of two to more than 20 persons, comprising up to three generation: parents, children and grandchildren (Fig. 2.5). This cohabitation of the generations in a joint family is the general rule in the whole northern mountainous region, and traditionally the family/relatives own most of the resources collectively and work on the arable land together. However, compared to Yasin valley (cf. STÖBER 2000b: 240), the number of households with joint families was considerably high (46 percent of the total).



Source: Author's own survey, 2001

**Fig. 2.5 Household Size in Odier 2001**

This rapid population growth in the valley clearly reflects the general practice of early marriage traditions, which is also endorsed by religious teachings. It is considered a religious obligation of the parents to arrange suitable spouses for their children. Most of the girls are married before the age of 20. Moreover, the infant mortality rate also decreased substantially due to UNICEF's vaccination efforts and improvements in diet and hygienic conditions throughout the region.

Large-sized households are also a salient characteristic of subsistence economy: having a large household is considered an important element in maintaining and expanding food-security (cf. SHARMA & BANSKOTA 1992).<sup>40</sup> In the prevailing socio-economic situation, where hands rather than mouths count for the self-sufficiency and future social security of a family, there is only a very limited expectation for the success of family planning and decrease in population, at least in the near future (cf. MEILLASSOUX 1983). In the meantime, permanent out-migration from the village has decreased; only one household has left the village in the last two decades (cf. Chap. 2.3.3). However, the number of seasonal migrants is increasing. During the years 2000 and 2001, more than 18 percent of the total population, exclusively male, remained outside the village for at least three months or more. Compared to Churit village in the Rupal valley of Nanga Parbat region (CLEMENS & NÜSSER 2000: 171), seasonal out-migration from this village is well established, with substantially higher participation (cf. Chap. 5.5.2.2).

### 2.3.2 Social Stratification, State Duties and Distribution of Social Groups

As it has become apparent from the above discussion (Chap. 2.2.2), the population of the former state was divided into many social groups according to their genealogical origin, place of residence (cf. GENERAL STAFF INDIA 1928: 44 and GOP 1999: 24) and social position in the feudal society. The social hierarchy was and still is a relevant and important factor in defining the access and utilisation rights of common property resources and arable-land ownership in the whole district. Although the entire system has gone through a lot of changes, in the case of Torkhow tahsil the notables and influential families still retain the ownership titles to pasture and other resources (cf. ISRAR-UD-DIN 1996, 2000 and FAIZI 1999).

The whole population of the state was divided into two groups, the *adamzada* and *fakir miskin* (cf. BIDDULPH 1880 and STALEY 1969), and both these groups were further subdivided into many subgroups for carrying out various state duties and paying the land revenue.<sup>41</sup> A few families of the *fakir miskin* class were placed in another group, referred to as a 'middle class,' ... *arabzada* or *yuft*, in the historical records (cf. AZIZ-UD-DIN 1897; GENERAL STAFF INDIA 1928; SCHOMBERG 1938 and FAIZI 1996b).

<sup>40</sup> However, despite this fact there are contrary perceptions as well. For example, according to BAIG (1997: 138) "... 'start living separately at an early age and marry young to procreate, you will never repent for these acts in your life.' "

<sup>41</sup> BIDDULPH (1880: 63) has further subdivided the *adamzada* clans into three hierarchical groups: Shah Sangallié, Zundré and Ashimadek (food giver). Both Shah Sangallié and Zundré had been exempted from the payment of land revenue until the second decade of the 20<sup>th</sup> century. In the 'food givers' class, BIDDULPH listed a total of 12 clans.

In many instances, the *arbabzadas* and *fakir miskin* were placed in the same social hierarchy. However, in the former state the *arbabzadas* were a minority group, and had been given higher status by the *Mehtar* as reward for their outstanding services.<sup>42</sup> Therefore, the *arbazadas* were relatively better off, while the *fakir miskin* were very poor, some having barely sufficient means to live (GENERAL STAFF INDIA 1928: 44).

According to EGGERT (1990: 43), the inhabitants of Torkhow tahsil belonged to eight different social groups. Of these eight, the three main groups were the *adamzada*, the *yuft* (responsible for military services) and the *boldoyu* (responsible for construction and maintenance of infrastructure). The elite groups (*adamzada*) were in the majority, followed by the *yuft* and the *boldoyu*. However, another social group, the *patani*, has been reported from the upper Torkhow area, above Shagram and Khot valley. They are said to rank below the Khushay and Baiekay clans (*adamzada*), and collectively represent the other clans (cf. ISRAR-UD-DIN 1996: 21, 2000: passim and BAIG 1997: 161). According to India Office and Records (IOR/2/1078/237/1C/160),

*“Patani is the term applied to ryots who, in turn for rendering services in the past, have been exempted by various Mehtars from doing begar and paying certain kinds of revenue.”*

The spatial distribution of these different social groups in Torkhow tahsil is also interesting, as there were some villages predominantly occupied by one social class. For example, *adamzada* were concentrated mainly in the lower-altitude villages, with the exception of Khot. Naturally, many unpaid workers (*shirmuzh*)<sup>43</sup> also settled with them in these villages. Contrary to this, *boldoyu* were concentrated in the high-altitude villages of the tahsil (c.f. App. 8).

Based on the allocation of state duties and realisation of land revenue, the inhabitants of Mehlp valley were divided into five social hierarchies. According to EGGERT (1990), the realisation of taxes and the distribution of state duties among these social groups were quite complex. There were fewer *adamzada* – only 19 households – and all of them were bodyguards. Six of these households were paying *sauring* tax only (supporting the British travellers and officials); the remaining 13 households were giving *ashimat* (providing meals for the *Mehtar* and his retinue) as well as *sauring*. The *yuft* or *arbabzada*, comprising 126 households, also served as bodyguards, and 50 of these households were paying only *thangi* (sheep tax). There were 58 *boldoyu* households. They were responsible for the maintenance of village infrastructure and were paying both *thangi* and *utakh* (supporting the touring local officials). There were also five households of hand workers working as blacksmiths. The state tenants (*rayat*) comprised 26 households in Mehlp valley (Tab. 2.3). Theoretically they were neither performing any state duty nor

<sup>42</sup> Although they were generally in the minority in the whole district, in Torkhow and Mulkhow tahsils there were considerably more *Yuft* households (23 percent of the total population) (cf. EGGERT 1990: 195).

<sup>43</sup> The word *shirmuzh* is a combination of two separate words, *shir* (milk) and *muzh* (marrow). It has two different meanings. *Shirmuzh* is s. b. on the land of a landlord, living in a house provided by the master. This name is also applied for milk relationships. For more details, see Hasrat (1996: 187); ISRAR-UD-DIN (1965: 134) and EGGERT (1990: 69ff.).

Tab. 2.3 Social Status, Land Ownership, Land Revenue and Associated State Duties of the Households in Mehlp Valley

| Oolat MEHLP  |                      |                          |                       |             | Land ownership  |                   | State duties |          |              | Payment of land and other taxes |            |           |       |
|--------------|----------------------|--------------------------|-----------------------|-------------|-----------------|-------------------|--------------|----------|--------------|---------------------------------|------------|-----------|-------|
| Gram         | Dur (Neighbourhoods) | Social status            | Names (Clans)         | Households  | Winter village  | Summer settlement | Body-guard   | Boldoyu  | Hand workers | Saurung                         | Ashimat    | Thangi    | Utakh |
| Mehlp        | Sorantek             | Yuft                     | Naskitek              | 7           | 25              | 7                 | 7            | -        | -            | -                               | -          | -         | -     |
|              | Bashandur            | Yuft                     | Bashe                 | 11          | 40              | 22                | 11           | -        | -            | -                               | -          | 11        | -     |
|              | Landur               | Adamzada                 | Sangalle              | 6           | 18              | 12                | 6            | -        | -            | 6                               | -          | -         | -     |
|              | Raghz                | Boldoyu                  | Raghzek               | 8           | 40              | 24                | -            | 8        | -            | -                               | -          | 8         | 8     |
|              | Chauni               | Boldoyu                  | Raghzek               | 4           | 8               | 4                 | -            | 4        | -            | -                               | -          | 4         | 4     |
|              | Sirkot               | Boldoyu                  | Raghzek               | 12          | 48              | 24                | -            | 12       | -            | -                               | -          | 12        | 12    |
|              | Baliandeh            | Yuft                     | Pininshowe            | 14          | 70              | 56                | 14           | -        | -            | -                               | -          | -         | -     |
|              | Rukut                | Yuft                     | Pininshowe            | 10          | 50              | 30                | 10           | -        | -            | -                               | -          | -         | -     |
|              | Lashtigaz            | Yuft                     | Pininshowe            | 6           | 30              | 18                | 6            | -        | -            | -                               | -          | -         | -     |
|              | Shuarch              | Boldoyu                  | Juduze                | 7           | 35              | 0                 | -            | 7        | -            | -                               | -          | 7         | 7     |
|              | Mutiandur            | Boldoyu                  | Mutie                 | 11          | 22              | 22                | -            | 11       | -            | -                               | -          | 11        | 11    |
|              | Ruaghch              | Yuft                     | Bashe                 | 3           | 12              | 0                 | 3            | -        | -            | -                               | -          | 3         | -     |
|              | Ghorda               | Yuft                     | Matume                | 6           | 54 <sup>a</sup> | 0                 | 6            | -        | -            | -                               | -          | 6         | -     |
| Moozhagram   | Yuft                 | Naskitek                 | 8                     | 4           | 8               | 8                 | -            | -        | -            | -                               | -          | -         |       |
| Shoat        | Shdiandur            | Yuft                     | Shadie                | 10          | 50              | 0                 | 10           | -        | -            | -                               | -          | -         | -     |
|              | Matumandeh           | Yuft                     | Matume                | 12          | 36              | 50                | 12           | -        | -            | -                               | -          | -         | -     |
|              | Khoshandeh           | Adamzada                 | Khoshe                | 13          | 52              | 40                | 13           | -        | -            | 13                              | 13         | -         | -     |
|              | Mahdalandeh          | Boldoyu                  | Makhdale <sup>b</sup> | 13          | 52              | 65                | -            | 13       | -            | -                               | -          | 13        | 13    |
|              | Shadiandur II        | Yuft                     | Shadie                | 10          | 10              | 20                | 10           | -        | -            | -                               | -          | 10        | -     |
|              | Dukan                | Hand worker <sup>c</sup> |                       | 5           | 10              | 0                 | -            | -        | 5            | -                               | -          | -         | -     |
| Lasakandur   | Boldoyu              | Lasak                    | 3                     | 9           | 6               | -                 | 3            | -        | -            | -                               | 3          | 3         |       |
| Odier        | Naskitek             | Yuft                     | Naskitek              | 9           | 9               | 9                 | 9            | -        | -            | -                               | -          | -         | -     |
|              | Odir                 | Rayat                    | Boule                 | 15          | 300             | 0                 | -            | -        | -            | -                               | -          | -         | -     |
|              | Sumalandeh           | Yuft                     | Somale                | 20          | 40              | 60                | 20           | -        | -            | -                               | -          | 20        | -     |
|              | Sheipandeh           | Rayat                    | Sheipe                | 11          | 55              | -                 | -            | -        | -            | -                               | -          | -         | -     |
| <b>Total</b> |                      |                          | <b>234</b>            | <b>1079</b> | <b>477</b>      | <b>145</b>        | <b>58</b>    | <b>5</b> | <b>19</b>    | <b>13</b>                       | <b>108</b> | <b>58</b> |       |

<sup>a</sup> Out of this 30 *Chak* land belongs to Prince Assad-ur-Rahman, Katore (One *Chak* is 144 square yards and equals to ca. 0,32 acres or 0,13 hectares).

<sup>b</sup> Later a few became bodyguards.

<sup>c</sup> All blacksmiths later became bodyguards.

\* For this group, the author mentions no clan affiliation

Source Eggert 1990: 181 (table 11, table format modified).

paying any land revenue.<sup>44</sup> They were responsible for the carriage of state luggage and for driving the *thangi* sheep to the capital (BAIG 1990: 6). This is also confirmed by the historical sources (GENERAL STAFF INDIA 1928: 44). According to ISRAR-UD-DIN (1965: 49), however, the low-class households were reserved for slavery; this was also reported by EGGERT (1990: 62) for Torkhow and Mulkhow tahsils. However, a social group bearing the same name (*rayat*) in Punial was responsible for paying a single goat on a monthly basis, besides performing other responsibilities (PILARDEAUX 1998: 369 and FISCHER 2000a: 66).<sup>45</sup>

Despite the aforementioned social hierarchy and distribution of state duties among the different social groups in the valley; there were many discrepancies in the organisation of communal labour and collection of land revenue. In practice there was very little difference in the payment of tax and performance of state duties among the non-*adamzada* classes. Although the *adamzada* households control more resources (e.g., water turns in the respective irrigation channels and arable land), the real disparity in resource ownership cannot be attributed to social status alone, at least in the case of Mehlp valley. Although some of the so-called *yuft* households became more powerful in the valley and got arable land in other villages as well (cf. Chap. 3.2.5), still their landholding size is not bigger than that of other households of lower rank. With the termination of the feudal system other factors – such as education, jobs in government sectors etc. – became more important than social status, and thus the whole situation in the valley changed greatly.

At the village level, the various obligations of the clans (cf. Chap. 4.6.4.1 & 4.6.5.1), to carry out village-related matters and responsibilities also endorsed equity among the households. At the present time, clan affiliations come into play only in connection with local elections, inter-clan conflicts or other related matters within and outside the valley. In the villages, the individual clans function as single organised units and as owners of important infrastructures, i.e., the water mills. The clans as well as individual households have been entrusted with carrying out different reciprocal activities, irrespective of their social status, and are accountable to the village community.

Households as units of social organisation at the neighbourhood and village levels are also responsible for performing specific local tasks. With regard to the performance of communal responsibilities, all households are considered equal, and no additional concessions are given to anybody except the village priests (cf. Chap. 4.6). This applies as well to all other interdependent activities within the framework of **combined mountain agriculture**, such as animal husbandry, irrigation-channel maintenance, and sharing draught power and agricultural implements. It also applies to burial arrangements,

<sup>44</sup> According to information collected for this survey, however, the real situation was quite different than this description. The concerned households reported that most of them had been regularly paying *thangi* (sheep tax) and also regularly performing state duties in the capacity of *boldoyu*. They even referred to the land parcels that had been confiscated from them as a result of deficient *thangi* payments.

<sup>45</sup> Unlike the situation in these areas, in Yasin valley the *rayat* households of a village were responsible for providing food for the travelling officials and fodder for their horses (STÖBER 2001: 77).



mosque management etc. The high-status households do have the leadership positions in organisational matters and are usually consulted in most of the village-related affairs. Nevertheless, although their suggestions and advice are respected, they cannot dictate to or impose their views on the villagers in any matter of concern.

One of the legacies of the old feudal system can be seen in Mehlp valley in the form of non-resident landowners. They belong to the royal family and other *adamzada* classes, and live in other villages of Torkhow tahsil as well as in Chitral town. The absentee landlords have considerable acreage of arable land and other resources in many villages of Torkhow tahsil, including two villages of Mehlp valley, i.e. Odier and Mehlp (cf. App. 8). No absentee landlords have been reported in Shoat village, although some of the emigrants from this village still have arable land there. However, most of the absentee landlords have sold their arable land to the local households; only about 25 percent of the arable land in these two villages still belongs to them.

### 2.3.3 Permanent Out-Migration from Mehlp Valley

Most of the inhabitants emigrating from villages on a permanent basis either leave their land in the care of someone else or sell it to their relatives. Thus out-migration from the villages brings changes in the ownership and occupation of arable land at the household level (cf. PRESTON & TAVERAS 1980).<sup>46</sup> This is particularly important in the mountain areas where, due to physical constraints, extension of arable land is not only difficult but in some cases impossible. Similar to other mountain societies (FRICKE 1989: 136 and FISCHER 2000b: 93) and according to the prevailing customary law, such migrants do not forfeit their inheritance by migrating away, and on the death of the parents the arable land is divided among the inheritors. The migrants' share of the land is then always purchased or occupied by the relatives who stay behind in the village. There may be a few exceptions, when the close relatives do not have enough financial resources to buy the land. However, they try to sell their distant land parcels and borrow money from others, in order to acquire the arable land of their relatives.

In the past, many households permanently left Mehlp valley for a variety of reasons. Only very few migrants ever repatriated and resettled in the villages. Most of them remained outside the valley. Since the 1970s, with changes in the political system and land ownership, the rate of permanent out-migration decreased drastically. During the last three decades less than ten families have left Mehlp valley and settled within the district or elsewhere. This process has created another category of absentee landowners in the valley. Many of these migrants had already sold their arable land to close relatives. Some of them, however, leased it to their relatives. In the context of resource management and ownership, permanent out-migration has played a major role in relaxing population pressure on the available resources. In the meantime the relatives left behind in the village have resumed their duties as tenants and thus their occupation/ownership of arable land has increased to some extent.

Many factors were responsible for the permanent out-migration in the past. Some of the important causes were: 1) inability to pay the land tax; 2) favour or anger of the

<sup>46</sup> Similar situation has been reported from the mountains of Europe as well (cf. RIEDER & WYDER 1997).

local rulers; 3) land development in nearby areas; 4) purchase of arable land somewhere else; 5) long-time absence from the village. More recently, 6) the establishment of businesses outside the valley has also instigated permanent out-migration. Details of local out-migrations for all these reasons are discussed below.

1. Households who migrated due to inability to pay land tax lost their usufruct rights to their land, became landless and left the village. They then became tenants of landlords elsewhere. Most of the households of Rayeen that originated in Mehlp valley belong to this category.
2. The pleasure or anger of local rulers and administrators also culminated in awards or confiscations of arable land. Both factors played a role in the spatial displacement of households until the 1970s.
3. Compared to other parts of the northern areas of Pakistan (SINGH 1917 and KREUTZMANN 1994), large-scale land development was initiated quite late in the different parts of the district (cf. ISRAR-UD-DIN 1965).<sup>47</sup> In the early decades of the 20<sup>th</sup> different projects for the amelioration of arable land were initiated in different parts of Chitral. Most of these projects were successfully completed with the help of the local people. In Torkhow tahsil only a limited area was brought under cultivation. Examples from the study area include the enclaves of Mehlp people in Sher Juli and Ghorda villages. In the latter case almost all percent of the households belonged originally to this valley.
4. Households who purchased land elsewhere in the last 30 years wound up settling in Booni, Drosh, Ayun, Chitral town etc. (cf. Fig. 5.4).
5. There are very few examples of persons who stayed away from the village for a long time.
6. Nowadays a few people are also engaged in business. They are responsible for providing the principal commodities to the village shops in the valley and thereby provide stimuli for the development of systematic socio-economic relationships similar to the well-established central place/hinterland structure in the Karakorum region (cf. DITTMANN 1994, 1997). Some of these households have already sold their arable land, but many of them still retain their holdings. In most cases the close relatives have benefited from this migration (e.g. in *moshin* management Chap. 3.4.3.2), although other households have also purchased some arable land from the migrants.

## 2.4 Resource Base, Political Evolution and Population Pressure: Summary

The valley, with its peripheral location, represents a typical extremely high mountain environment for human habitation in the Eastern Hindu Kush. The cold and arid conditions not only restrict crop growth, but also limit the vegetation period to only five to six months per year. Therefore, the whole valley is devoid of natural vegetation

<sup>47</sup> This has been attributed to both the system of political organisation and the sale of subjects as slaves in the neighbouring territories. According to STEIN (1921: 52), either the income from the slave trade was enough for the rulers, or there was no surplus population left to extend the area under plough and reclaim the deserted land.

except for drought-resistant bushes and scrub plants. Affected by both the altitude and climate, the natural resource base is characterised by low productivity, seasonality and an extremely limited regenerative capacity. Due to this combination of factors – the extreme climate, the altitude and the remoteness of the location – alternative sources of income such as horticulture, catch crops, tourism etc. are not possible. Therefore, the inhabitants are highly dependent on the available resources for sustenance. For long-term productivity, these resources need intensive care and high labour input from the households and villagers.

The political organisation has also played a role in the distribution of the natural resources here by creating different user groups at the village level. Before 1970 conditions were extremely unfavourable for the majority of the households. For the common man, there were no incentives for investment in land resources. Since then, the whole resource ownership situation has changed. Although the local elites have played a very important role in defining resource ownership and access rights, the households have received de-facto ownership of the arable land and other resources. With the change in the political system, the entire socio-economic set-up has been transformed. Facilities and basic amenities, such as primary and middle schools and other basic infrastructures have been established in the valley. In the last two decades NGOs have also contributed, instigating many development activities, mostly in agricultural sectors, in all the villages of the valley. The improvements in physical access and electrification of the whole valley, including the summer settlements, are credited to AKRSP.

Despite these socio-economic and political changes, the population growth in the valley has remained very high. This has resulted in increasing pressure on the limited and highly fragile resource base. Although permanent out-migration has practically ceased, seasonal-labour migration has increased.

## 3 Resources: Ownership, Utilisation and Management Mechanisms

### 3.1 A Classification of Property Regimes

For management and utilisation purposes, natural resources are kept in different property regimes. These are sets of clearly defined rights and duties, which characterise the relationship of individuals, as well as groups, to one and other with respect to the resource in question. Moreover, according to BROMLEY & CERNEA (1989b: 5),

“[...] property is not an object such as land, but is rather a right to a benefit stream that is only as secure as the duty of all others to respect the conditions that protect that stream” (sic).

Accordingly there are four different types of property regimes: private or individual's property, state property, common property and open-access or nobody's property.<sup>48</sup> But in real life situations there can be a combination of more than two regimes, as well as some usufruct rights in the case of state property. In such cases, the state is the real or legal owner, and the user or occupier community can be either de-facto owners or have usufruct rights only. The ownership regimes are not static but are subject to changes with the passage of time, following new legislation or an amendment of the existing laws, or a change in the form of government. Property rights need a very clear and elaborate definition because they govern the control of resources and the derivation of income by their ownership. They govern moreover the right to possess, use, manage, alienate, transfer and gain income thereof (cf. SMETHURST 2000: 48). The different property regimes as defined by CIRIACY-WANTRUP & BISHOP (1975), OSTROM (1990) and BROMLEY (1991, 1992) are briefly elaborated below.

**Private Property (res privata):** This is the most popular and well-known regime, in which access to the benefit streams is held either by an individual or by a whole group as corporate owners. Private property is usually inheritable, and can be traded in the market (see below). The owner has legal and social authority to exclude non-owners. In case of encroachment by others, state protection is always guaranteed, and the whole community respects the owner's access right and ownership. The owner is not free to do what he likes with his property, but is allowed to undertake only socially acceptable uses and must refrain from socially unacceptable uses (BROMLEY 1989).

**Common Property (res communis):** In this case, a group of households or a village community is de facto or de jure owner of the resource in question and has the right to exclude non-owners. All co-owners are entitled to the resource units in a predefined system, and collectively devise a systematic plan for extraction and appropriation. The

<sup>48</sup> Literature on property regimes and especially on common property has been rapidly growing for the last three decades or so. Some of the important sources are: DEMSETZ (1967); NETTING (1974, 1976); CLARK (1982); JODHA (1987); WADE (1987a & b); BERKES (1989); BERKES et al. (1989); BROMLEY & CERNEA (1989a & b); BUCK (1989); FEENY et al. (1990); OSTROM (1990); ARNOLD & STEWART (1991); ROBERTS & EMEL (1992); SINGLETON & TAYLOR (1992); IFAD (1995); KURIEN (1995); BAKER (1997); FREUNDEN, CARNEY & LEBBIE (1997); BERKES & DAVIDSON-HUNT (1998) and NATIONAL RESEARCH COUNCIL (2002).

shares are usually inheritable with some prerequisites, and in many cases cannot be traded in the local market. The descendants have access either to equal shares or are entitled to a fixed proportion of the total share. This varies according to the nature of the resource and its importance for the livelihood of a community of co-owners. For the appropriation of resource units, equity in access and distribution of shares (as perceived by the group) is always maintained – this being one of the main conditions for the long-term successful functioning of a common property system. Another important characteristic of this regime is the existence and functioning of a well-defined institution for handling the distribution of benefits and responsibilities among the co-owners. This institution has a *de facto* or *de jure* authority for the formulation and promulgation of bylaws, and simultaneously provides a mechanism for instant and low-cost conflict resolution among the members. This type of property regime always has a clearly defined boundary with a fixed number of co-owners.

**State Property (*res publica*):** Here the state reserves the ownership of a resource and delegates some usufruct rights to the community. The state management may take many forms, such as lease, issuing licence for use or taxation etc. Sometimes state agencies are independently responsible for the management and utilisation.<sup>49</sup> In this context, forest resources are a typical example of state ownership in many countries. Regarding other resources such as pastures and range land, state ownership (especially in the developing countries) is nominal, and the nearby village communities are the actual and real decision makers for management and utilisation. In cases of inter-village conflict, state authorities intervene and practically take over the ownership. The nationalisation of forest in Nepal is one of the typical examples.

**Open Access (*res nullius*):** This property regime is open for all, without any property rights, and the extraction system is based on a simple principle of “first come, first serve.” Open access is a result either of the breakdown of an existing institution or a change in the type of government. In some cases, a village community may also make an independent decision and declare a previously common-property grazing land or pasture area to be an open access. Basically this situation lacks institutional arrangement or organisational structure for the enforcement of property rights and exclusion of non-owners from the benefit streams (see above) of the resource in question. The nationalisation of forest resources has in many cases led to this type of property designation, where an inefficient state authority replaced the decentralised village management system (cf. DIETZ et al. 2002: 11).

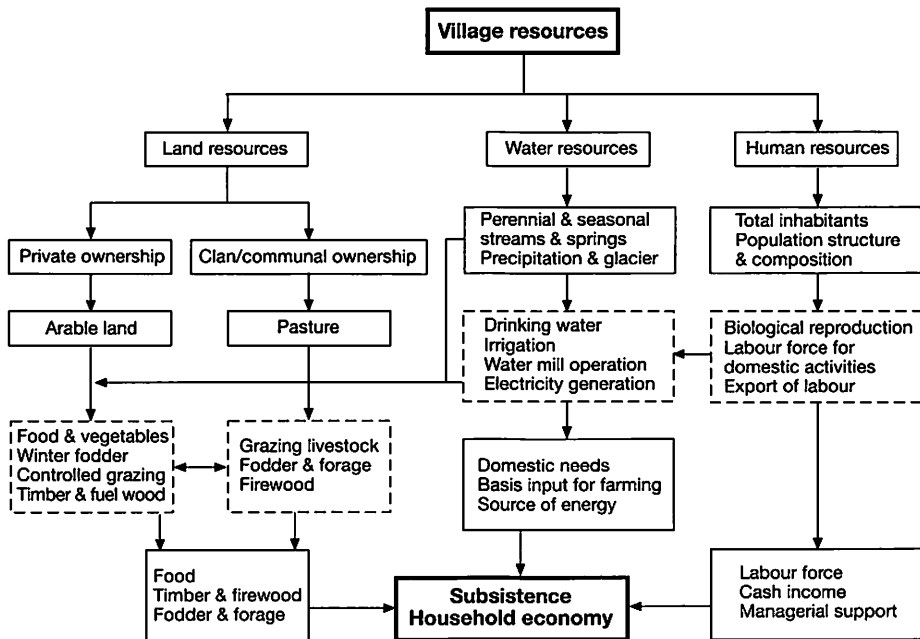
In mountainous regions the resource ownership is varied. In Mehlp valley, the individual villages have well-defined horizontal and vertical territories with clear boundaries. Within the limits of this demarcated area, all the available natural resources are owned or utilised by the villagers with different ownership regimes. Here, all the ownership titles and usufruct rights are held in *de facto* and the state has not yet recognised the ownership rights of the owners (cf. Chap. 2). Except in the case of arable land purchased by the households, written records of ownership and inheritance are neither kept

<sup>49</sup> However, the situations of ownership and utilisation rights of the state-owned forest resources in the Northern Pakistan are quite complex. For more details on the management systems of forest resources and evaluation of communal utilisation rights see AZHAR (1989).

by the state nor by the village communities. The whole system of land boundaries and share-and-access rights is maintained through traditional knowledge, which is orally transmitted from one generation to another. In this way every household knows its own rights and respects others' rights by performing their own duties. In case of any dispute or conflict, physical witnesses are presented to the village elders or courts, and the old usage pattern is considered to be a main supporting proof.

Usually, land that falls within the command area of irrigation channels in both winter and summer settlements is held as private property, and is mostly owned by a household head. Irrigation water, which is the single prerequisite for the productivity of arable land <sup>50</sup> (cf. Chap. 3.4.4.2), and pastures are treated as common pool resources and are kept under communal or joint ownership regimes. Moreover, within the communal ownership, the villagers have formed different user groups with pre-defined membership and clear access rights. These include users of water from the irrigation channels and other groups of households, to whom part of the winter/spring pasture area has been allocated exclusively for fuel-wood collection. The whole livelihood system of the inhabitants depends on these resources.

Due to physical and climatic constraints productivity of these resources is low, with extreme seasonal fluctuation, and a single resource (arable land or alpine pasture) is not



Source Draft and drawing, Fazlur-Rahman 2003

Fig. 3.1 Odier: Share of Village Resource in the Subsistence Economy

<sup>50</sup> Rain-fed agriculture (*lalmi*) is practised on a very limited scale in the southern part of the district along the main valley, especially in the vicinities of Drosh, Ayun and Kesu villages (HASERODT 1989a: 108; HOLDSCHLAG 2003: 33).

sufficient for the subsistence (survival) of a household. Therefore all these resources, in various ownership regimes, are integrated to ensure the provision of basic household needs.

For example, the villagers are dependent on water resources for drinking, irrigation and running their water mills; likewise arable land produces food, firewood and fodder; and pastures are the main resource for seasonal forage, grazing, firewood collection and haymaking. Thus, all the resources in different ownership regimes are amalgamated and used as production inputs, as well as supplementary sources, to ensure subsistence livelihoods at village and household levels (Fig. 3.1).

### **3.2 Land in Private Property or Individual Ownership**

In mountainous areas in general, as well as in Mehlp valley in particular, arable land is one of the most important and scarce natural resources. Here the physical conditions, climate, topography, availability of water and altitude all have a direct impact on the availability of a suitable piece of land for productive use. Due to these limitations, the area appropriate for agriculture at a single location is not sufficient to supply the farmers' day-to-day requirements. Increase in human and livestock population has further necessitated the development of less favourable land at higher altitudes, in order to provide basic staples: additional food for the people, fodder for the livestock, and fuel wood and timber for domestic use. In traditional societies, land serves not only as a means of production, but carries other social significance as well. It is one of the main causes of disputes, quarrels and court litigation between families, clan groups and villages. Moreover, land is the single binding force against permanent out-migration from the mountains. Owning land has diverse implications for all segments of the domestic subsistence economy. On the one hand, individual land ownership allows determines the grown of a diversity of crops per annum, which reduces the risk of crop failure and expands the subsistence of a farmer. On the other hand, it also reduces the dependency of a household on the market for basic food items. The surplus farm production also contributes to the cash income of a household.

Other segments of the traditional subsistence economy, e.g. animal husbandry (cf. Chap. 4.3), are thoroughly integrated with agriculture and at the same time highly dependent on arable land. The arable land produces substantial quantities of fodder both for forage and stall-feeding during the winter season. In most cases, about half of the arable land is set-aside for fodder crops. The provision of fodder is extremely crucial and directly determines the number of livestock a household can raise. With enough land, a household can spare more acreage for fodder crops and irrigated grass, and thus can keep more animals. The other possibility is to sell the surplus fodder in the villages – fodder is always in limited supply and fetches a very good price, especially in early spring. The same is true in the case of timber and firewood. Both are procured mostly from the arable land, and are always in short supply due to long, severe winters and relatively short growing seasons. Thus it is clear that land ownership plays a very important role within the subsistence economy of mountain villages.

### 3.2.1 Location of the Arable Land at Different Altitudinal Levels

As a common adaptive practice and risk-mitigation strategy in most of the mountain regions of the world fields belonging to the households of a village are dispersed horizontally as well as vertically (cf. NETTING 1974; RHOADES & THOMPSON 1975; ORLOVE & GUILLET 1985; BRUSH 1988; STEVENS 1993 and MACDONALD 1998). In village Odier the arable land is spread over five different locations ranging in altitude from 2,800 to about 3,300 m a.s.l. in three summer and two permanent settlements.<sup>51</sup> The lower part of the village lies between 2,800 to 2,950 m, and constitutes 21 percent of the total cultivated area. The upper part of the village is located between 2,950 and 3,000 m, and covers 40 percent of the total cultivated area. All the households have their arable land in these two sections of the village. The summer settlements, Romolasht and Nashtani, are located to the south and west of the village, at an elevation ranging from 3,100 to more than 3,200 m and 39 percent of the total area of the village is located there. The majority of the households have their arable land in Romolasht; Nashtani belongs to a single clan (Somalay) (Fig. 3.2). Only three households of Shadeyay clan have their land in the neighbouring village Shoat, which they occupy at their convenience in summer or winter. Aside from these three locations (the upper and lower parts of the village, and the summer settlements), a former pasture area has been recently ameliorated and 50 households have an additional share of arable land there (cf. Chap. 5.6.1).

The intensity of land use also varies according to elevation, with niche-specific uses and crop cultivation. Land in the lower and upper parts of the village is most intensively used for food and fodder crops, irrigated plantation and grass for haymaking. Food crops cover the largest area, with winter wheat (28.2 percent) in the lower parts of the

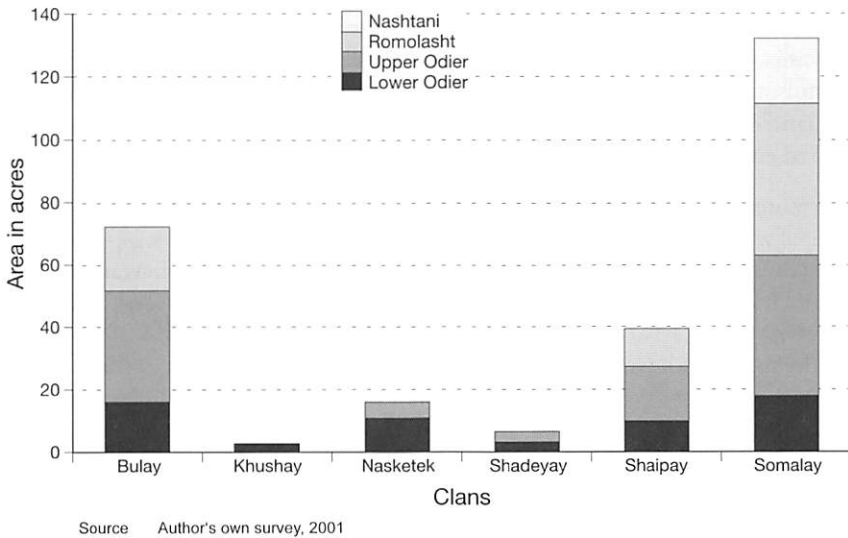


Fig. 3.2 Odier: Clan-wise Location of Cultivated Land

<sup>51</sup> Six households from the Shaipay clan, three from Somalay and one from Bulay have arable land outside the territorial limits of this village. This land has been exclusively given to lucerne and irrigated plantations.



village, and barley (24.5 percent) in the upper. Most of the irrigated grass, plantations and fruit trees are also located in upper and lower parts of the village. In the summer settlements, land is predominantly used to grow food and fodder crops. The latter (lucerne) constitutes 36.8 percent of the total cultivated area of Romolasht and 53.5 percent of Nashtani, respectively. Area under grass and plantation is negligible in the former, whereas in the latter, a considerable area is also given to plantations.

### 3.2.2 Land Tenure System in the Historical Context

The legal relationship between the operator and the land he operates is of crucial importance for a variety of reasons. The legal tenancy structures here have developed in close reliance on political system, and the existing land tenure systems in the village can be easily traced back to the evolution of the political set-up and social organisation of the whole region. Land tenure is a dynamic process, and may change according to the type of government and system of administration. It is a key factor in making decisions regarding use or input supply and, most important, land tenure ensures the long-term productivity of the land. Moreover, there is very close relationship between land tenure and intensity of use: generally, land held under the tenancy system is not intensively used; rather it is put to uses in ways involving relatively low labour inputs and more benefit for the tenants.

There are many possible reasons that land under tenants is not efficiently used. The most pertinent factors are availability of water, labour force and other inputs from the side of the tenants. Normally the tenants are potential purchasers of the land on which they are working and thus, to keep the land prices low, they are not investing in the improvement and further amelioration of this land. This is an intentionally adopted strategy, as the fields themselves are much more expensive than the potentially cultivable waste. On the other hand, in spite of the short-term benefits of cultivating the wastelands, the investment in land development is much greater in the long term both for the landlord and the tenant. Therefore, no new fields are developed until the land is purchased either by the tenant or by someone else.

Furthermore, the landlords have their fixed share of water, which, according to the traditional water allotment rules, cannot be increased (cf. Chap. 3.4.4.2). The potential purchaser of this land (the tenant), on the other hand, is usually a villager who already owns other land in the village. This means that he not only has water shares in the channel serving this particular piece of owned land, but usually has access to water from other parts of the irrigation system, more than this plot of land needs. Usually the tenants will invest more for the development and improvement of their own inherited land, at the expense of their leased land. Thus a change in land tenure not only increases the size of the households' holding, but also brings drastic changes in the intensity of use.

In Mehlp valley, during the *Mehtar* period land tenure was totally uncertain (cf. Chap. 2.2f.). The former ruler was the supreme owner of all land within the state boundary. The landlords were from the upper class (*adamzada*), and had large estates located at various locations in many villages. Most of the land owned by these absentee landlords had either been confiscated from the local villagers by the ruler in the past, or had re-

verted to the state in the absence of any male inheritor after the death of a household head <sup>52</sup> (SCHOMBERG 1938: 101; ISRAR-UD-DIN 1965 and BAIG 1997: 131). Another major reason for losing usufruct right of the arable land was a household's inability to pay the annual land tax (cf. Chap. 2.2). Whatever the case may be, this land was granted to local notables and administrative officials in reward for their services or loyalty during a time of fighting for the local throne.

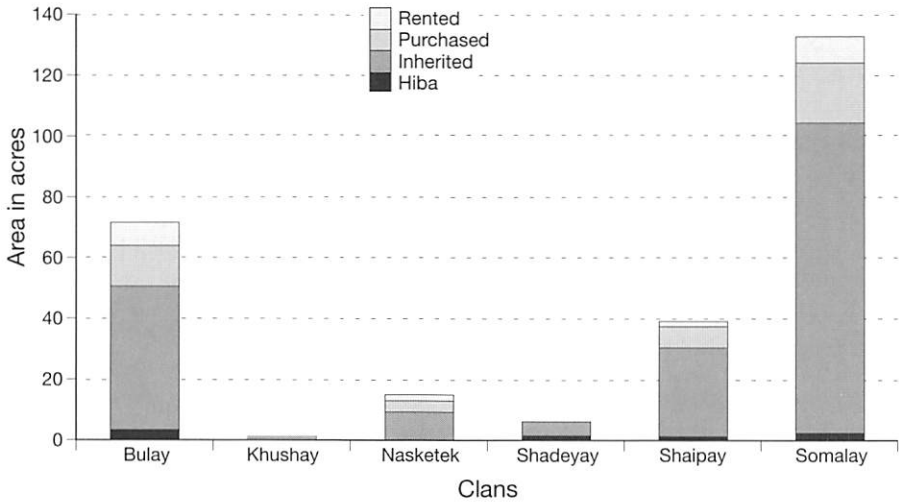
The majority of the inhabitants of the valley were treated as state tenants (*rayat*). They had inheritance rights subject to their paying the different taxes imposed by the rulers and successfully performing their associated responsibilities. Later on, some reforms were introduced in the taxation system, but the tenure of the lower class remained uncertain, as observed by STALEY (1969: 232f.):

*"Below the adamzada came a large class of farmers [...]. As land-holders they were 'entitled to consideration', but their rights to the land were qualified by a system of obligations attached to particular plots: in the last analysis all the land belonged to the Mehtar, who had the explicit right to evict farmers who did not fulfil the obligations [...]. In addition to their nominal ownership of all land, the Katore Mehtars and other rulers had direct control over estates in different localities, the usufruct of which could be granted to senior state officials, powerful supporters, or personal confidants as rewards for their services. By this means – and also through the distribution of valuable imported luxury goods for personal display, and by changing the order of precedence on court occasions – the Mehtar could advance or retard the fortunes of particular families. Since land, income, wealth, and social status were closely linked, these procedures were important in promoting social and economic mobility."*

The tenancy system in the former state of Chitral was complex. ISRAR-UD-DIN (1965: 133f.) identified five different types of tenure systems involving the owner operator, as well as four tenancy patterns based on terms and conditions between the owner and tenant, share in land products and residence of the tenants. In general, all these types of tenure are still in practice and can be found in most parts of the district. However, only two tenure systems are common in the study area.

With the passage of time, land tenure in the study area changed, and in the early 1970s the villagers became owners of the arable land, which they had previously cultivated and maintained through the payment of taxes and performance of other responsibilities. Since then, tenure has become more secure, but the legacy of the past remains in the form of absentee landlords throughout the whole tahsil (cf. HASERODT 1989a: 112; EGGERT 1990; BAIG 1997: 168 and ISRAR-UD-DIN 2000: 57).

<sup>52</sup> In the past, such land was put into the category of *birdu basho*, which literally means "share of the deceased person" in the local language. Sometimes this land was also given to the near relatives or neighbours upon the payment of land tax and performance of other associated duties. Since these taxes and related duties were a very heavy burden, withholding more usufruct rights was difficult; therefore the local people were reluctant even to accept such land. The better choice for them was to work the land as a tenant, free from the onus of land tax, and to receive some favour from the landlord in the form of exclusion from forced labour etc.



Source Author's own survey, 2001

**Fig. 3.3 Odier: Clan-wise Land holding Status**

Absentee landlords own the best and most fertile fields in the lower and upper parts of the village, and many households are working on these estates as tenants. Also in the meantime, many family members of the present households have left the village and settled elsewhere, thus creating another group of absentee landlords (cf. Chap. 2.3.3). In this case, close relatives ... usually brothers who remained in the village have taken over the arable land as tenants. Both of these sorts of absentee landlords have already sold part of their land to the villagers. Some households have also received cultivated land as a gift (*hiba*) from the former absentee landlords and their own relatives (Fig. 3.3 and Map 3.1: see suppl.).

In this context, land tenure can be defined as the rules in operation in any society regulating the people's rights and obligations in relation to land, including conditions and time limits on the use of land resources.

### 3.2.3 Local Tenancy System and Traditional Responsibilities of the Tenants

There are 29 households (24% of the total) in the village working as tenants-at-will. They also have their own land. They are taking care of the land of the absentee landlords as regular tenants. Only a few of the landlords have much land, most of them having small parcels containing one or two fields with grass and irrigated plantations. The terms and conditions of the tenancy are agreed upon between the landlord and the tenant, mostly in an informal way. The deals are arranged in the presence of a few persons without any written agreement, and no written records are kept for any input or output. Because the whole system has become part of the traditional knowledge, everybody in the village knows very well the relevant rules and obligations. The landlord has no responsibility other than to visit his estate a few times during the season. The entire agricultural work – from sowing, supplying the manure and seed, irrigating, weeding,

harvesting and taking the landlord's share to his house – is the responsibility of the tenant. He is also responsible for any communal work, and is accountable to the villagers for other duties associated with his position as a tenant. He is free to use the land, but sometimes partially dependent on his master for the selection of crops.

The general rule is that the annual produce, after deducting the seed for the next season and the *ushur* (tithe), is equally divided between the landlord and the tenant. Except for *Prangos pabularia* (*moshin*) located in the high pasture (cf. Chap. 3.4.3.2), all by-products, including grass and any other fodder grown around the arable land, is given to the tenant as a manure supply for the land. He is also allowed to withdraw firewood from the irrigated plantations and nearby uncultivated area. Every year in spring he should also plant a number of trees, but this is not obligatory.

Usually the landlord is invited for the threshing, to control the production. This takes two to three days, depending on the land area and mode of threshing. During his stay he is treated as a guest of honour, and the tenant, together with his family and other relatives, does the whole work.<sup>53</sup> Later on, at his convenience, the tenant also transports the landlord's share to his residence.<sup>54</sup>

In normal circumstances, if the tenant is to be evicted, this takes place in the autumn, after the completion of the agricultural season; otherwise the tenant must be compensated for his labour as per traditional rules. The tenant is also free to give up his services at any time without preconditions, but normally the landlord is informed in advance, so that he has time to make necessary arrangements beforehand. If the landlord wishes to sell his land, the tenants have the first right to buy the land, and can expect to receive concessions in the form and mode of payment. The payment plan entirely depends on the financial resources and purchasing power of a tenant. In land transaction deals involving old emigrants, relatives and kin are preferred, and payment is made in easy instalments.

Quite often the absentee landlords also levy some extra duties and responsibilities on the tenant-at-will. For instance, during the summer the landlord may hand over his or her sheep and goats to the tenant for seasonal grazing and to be looked after for about three to four months. The tenant is also sometimes obliged to drive his landlord's non-lactating cattle into the high pasture for free grazing, and also to visit them once or twice during the summer season. For these extra engagements, the tenant is paid according to the local traditions (cf. Chap. 4.3.2.4).

The tenancy system within a circle of relatives is conducted in more or less informal ways. Neither is the landowner invited for the threshing, nor is he consulted for the selection of crops. In many cases the arable land belonging to the landlord is difficult for outsiders to recognise, because of successive fragmentation and inheritance among

<sup>53</sup> Nowadays, with the introduction of threshing machines, the tenants' work has become easier but more expensive. According to the local tradition, the landlord contributes nothing for threshing; the tenant has to pay all the charges alone.

<sup>54</sup> Since local jeeps are plying the road almost daily and the tenant can utilise this facility, this task has become relatively easy and needs no labour. However, the tenant has to bear all the transportation charges as part of his traditional responsibility.

the relatives. In this case, the operator of the land either pays the landlord a certain amount of money, or gives him other area-specific products in barter. Money is usually paid in the case of fodder crops, as they do not require any manure. However, the actual situation varies from case to case and according to the place of residence and financial position of the relatives. Normally the operator of the land pays an annual visit to his relative and delivers some gifts and other things on this occasion.

### 3.2.4 Customary Laws for the Alienation of Arable Land

Changes in land tenure, held as individual property, are carried out in a variety of ways. In theory, all the inheritors are entitled to their share; however the actual division of land among the heirs is quite varied. In Odier village, arable and cultivated land is divided among the inheritors very roughly, and the process tends to be considerably biased. Only sons can claim and equally divide the land among themselves. According to the local traditions, the male offspring are the real inheritors of the arable land and other property, and unlike the inheritance system in Nager, where the oldest son gets the largest portion of the property (cf. HEWITT 1989: 349), they are eligible to equal shares. The female offspring are only considered heirs when there is no male inheritor, and in this case the Islamic inheritance laws are followed.<sup>55</sup> However, unlike the traditions in Punial tahsil,<sup>56</sup> there are no set preconditions for the son-in-laws, and they/he can inherit the respective share. Also, the value of individual land fragments affects how inheritance is divided. Due to physical factors, the fertility of different parcels of land is not uniform; even a slight difference in altitude between the fields not only determines crop suitability but also affects harvesting time (WHITEMAN 1985 and EHLERS 1996). Therefore, the inheritors divide the plots at each location.

Many different methods for distributing land among the inheritors are followed according to the individual situation. Normally the father, as head of a family, owns the whole land until his death, and he always reserves the right to alienate any of the inheritors.<sup>57</sup> He may distribute his holdings among his sons during his lifetime; otherwise the eldest son does this after the father's death. Another possibility is to appoint an arbitration council consisting of the village elders for this purpose. In any case, there is no tradition of properly measuring acreage before distribution. Rather, all the land in the different locations is roughly divided into sections or parcels according to the number of inheritors, and then either the youngest or the eldest son is given the first right to select his single portion. During the process of distribution and allotment, rather than using actual size measurement as a determining criterion, special care is taken with respect to the location and fertility of the fields and other categories of land, such as grassland and plantations etc. Similar to the extreme situations reported from the Afghan Hindu Kush (cf. GRÖTZBACH & STADEL 1997: 17), irrigated plantations, grassland and walnut

<sup>55</sup> For more details on the various aspects of Islamic inheritance laws see ADEGEYE (1975: 64f.).

<sup>56</sup> According to FISCHER (2000b: 91) "[...] in case there is no son one son-in-law inherits the property [of his father-in-law] if he gives up all claims to his own father's property."

<sup>57</sup> Basically the father, as head of household, is the principal owner of land and other properties. He has a *de jure* right to alienate any of his sons or daughters from all his property. This is performed in public, before witnesses, or in written form.

trees are sometimes not actually divided, but are kept under joint ownership. This is usually practised when the resource in question is limited and further division would create uneconomical fragments. In such cases, the heirs either take yearly turns or they distribute the products after harvest equally among themselves. Poplar and other trees are also distributed according to their size and numbers, irrespective of the land on which they are standing. It is not uncommonly that the land belongs to one person, and the trees standing on it belong to another relative.<sup>58</sup> According to tradition, and commonly practised in most parts of the Northern Areas (BARTH 1956a: 75; POTT 1965: 246; BAIG 1997: 137f. and STÖBER 2000a: 75), the parents' old house is always given to the youngest son. When two brothers (inheritors) are not satisfied with the allocation or distribution of land among them, they can exchange their respective arable land parcels; this procedure is called *bash-gheraik*.

As a property in private ownership, arable land can be purchased, sold or given to others as a gift. Since the village is an illiterate society that practises a complex system of secondary and overlapping rights over the land of others, without maintaining any official records of ownership and transaction, it is very important to mention the traditional land transaction system with special regard to sale. The above-mentioned factors necessitate a very clear and transparent land transaction procedure to avoid future litigation and to maintain at least minimal records of boundaries in vague tenure circumstances. The salient features of land transaction in the village are explained below:

In case of the sale of a field, the owners of the adjacent plots, mostly from the same family or clan (cf. POTT 1965: 246), have the legal and Islamic right (*haq-i-shufa*) to first-purchase of this land (cf. LENTZ 2000: 300ff.). Therefore the testimony of sale is written and the ownership rights are handed over in public, in the presence of the neighbouring owners. In this way, these neighbours can check the boundaries mentioned in the testimony and also clarify any other relevant issues, with the new owner.<sup>59</sup>

Their signatures on the land-transfer document are not only important in confirming the validity and legitimacy of the boundaries, but also signify their acquiescence to the whole land transaction process.<sup>60</sup>

<sup>58</sup> Such dual ownership is normal in the village, and sometimes even crosses the boundary of blood relations. This is a legacy of the past, when the households having more land allowed poorer households to plant trees on their land. Nowadays, with increasing stress on arable land, this generous practice is no longer observed – but one can often find cases of dual ownership in the village.

<sup>59</sup> The right of pre-emption works when land is offered for sale according to the normal procedure. When the property is put up for bid (*boli*) or auction (*lilam*), however, then the right of the neighbours is automatically invalidated. Resolving problems of physical access to the land parcel in question is still one of the main prerequisites for such a deal. Nevertheless, the practice of offering a higher price for an item to lure other interested customers to bid higher is frowned upon in Islam (cf. SAHIH AL-BUKHARI, Vol. 8 Hadith No. 92).

<sup>60</sup> The same procedure is also practised elsewhere. For example, in Nigeria it is reported that one contemporary precondition for the sale of land under customary law, apart from payment of the price, is evidence of the 'handing over' of possession in the presence of witnesses. In cases where a head of family dispossesses his family of property without the consent of the other principal members of the family, the sale can be made void by those members not consulted (ADEDIPE et al. 1997: 101).

This is especially taken care of by the buyer (new owner) to avoid any bad consequences. The findings of BARTH (1956a: 44) show a similar system of land transaction in Indus Kohistan:

Although, with the permanent settlement, persons own particular fields and plots of land, their right to alienate is limited – the Islamic first rights of close kin, and of neighbours, are recognised. Thus, before selling to a non-lineage member, the permission of the lineage is required, and before the sale of land to an outsider is valid, it must be approved by the village council.<sup>61</sup>

All other shareholders and potential inheritors of the piece of land being sold must also know about the deal, as they also have a *de jure* as well as *de facto* priority for purchasing it. Therefore, they must also sign the testimony (*sanaad*), signifying that they recognise and do not have any objection to this deal, and that the boundaries mentioned in the written statement are correct. This is again very important in cases where land-for-sale is not properly measured in any units (e.g. *kanal*, *chakorum* or hectare etc.),<sup>62</sup> and is sold as a single piece. This is a common practice in the village: a person can easily pool all his land, including both arable and uncultivated parcels, and offer it for a lump-sum price. Any other resources, i.e. water share and *moshin* ownership (if any), are also mentioned together with the respective amounts of the resource that are to be included. For the purpose of orientation and clarification, only the outer boundaries of the land in question are mentioned in the land transaction document, with detailed reference to the surrounding parcels.

Aside from the neighbours and relatives, all the villagers should also be informed of the transaction process, as most of the time the villagers also have certain rights associated with the land under transaction. Their rights include layout of paths, roads, seasonal and permanent animal passageways and watercourses. Such communal uses, if any, are always excluded when land is measured and sold for a unit price. The presence of the village elders is necessary to further confirm that the new owner accepts the villagers' subsidiary claims and rights, and moreover, that he also acknowledges and guarantees the existing usage patterns for the future. For this the signatures of a few elders, including the village priest, are important. In cases where the land is not measured and sold for a lump-sum price, then all such uses are clearly mentioned in the written document. The document confirms that the traditional usage patterns and secondary access rights (if any) will be honoured without any particular specification. This again is entrusted to the village elders and cleared accordingly, based on the customary law and traditional knowledge. The physical presence of witnesses is of paramount importance in such cases, where there are no written records of land ownership other than the testimony. Any loopholes or ambiguities not cleared in the written documents may cause court litigation. Therefore, it is also important to have some neutral persons as witnesses to

<sup>61</sup> The same practice of land transaction has been reported from Punial and Hunza valley in the Northern Areas of Pakistan, with some regional variations (cf. ALLAN 1985a: 251; BUZDAR 1988: 14; KREUTZMANN 1989: 58 and FISCHER 2000b: 94).

<sup>62</sup> *Kanal* is a unit of land measurement mostly used in the settled areas. One *kanal* is equal to 0.125 acres or 505.86 sq. meters. *Chakorum* is a local unit of land measurement equal to 36 square yards. Approximately 7.75 *chakorum* is equal to 2.48 acres or ca. one hectare.

the deal. This strategy ensures the easy availability of a witness in case of any future litigation concerning this piece of land, its boundaries, water rights and physical access.

Land transaction also involves other crucial resources held under communal ownership (irrigation water and *moshin*), including physical access. These are very important and especially cared for in purchasing land in the village, because these are the main factors influencing land productivity and, most of the time, concern other stakeholders. These resources include shares of irrigation water, in terms of source (channel etc.), time and amount, *moshin* if any, seasonal alignment of footpaths leading to the land from pastures, and access to animal passageways and drinking water in the village. All these factors are mentioned in the testimony in detail, according to their relevance. Thus everyone involved – the new owner of the land and his neighbours – has all the relevant and necessary information and, at the same time, also acknowledges the terms by signing the testimony in public.

This system of traditional land transaction also provides a good opportunity, as well as a mechanism, for registering, legitimising and recognising the secondary rights of other households, groups or villagers with respect to the land purchased by the new owner. The old usage patterns, in many cases with other supporting evidences, are generally accepted and further endorsed as a legitimate right for the future. Nobody can marginalise his opponent by misusing his influence and power, as there are many witnesses to this statement. At the same time, nobody can write an incorrect statement in the testimony, because everything has been agreed upon between the two parties and concerned households and groups on the spot. This also favours and provides extra support for illiterate persons, as the whole procedure is conducted in public. This system also ensures that, in case of emergency, the new owner does not face any severe problem in finding witnesses for the courts on matters not clearly mentioned in the land transaction document.

Compared to other villages where permanent land settlement has already been carried out and ownership records are maintained by the revenue department, this system of transparent, public land transfer without such records is one of the best alternatives for lessening land-related conflicts and court litigations. In the former case, because the land-transfer and ownership records are not open to the public and are maintained by revenue officials, there is always a possibility of corruption. A person can change land ownership and field boundaries in the existing records by improperly using influence or power, or by bribing the concerned revenue officials (*patwari*). In case of litigation, the revenue officials are solely responsible for double-checking and presenting the actual and correct information to the courts. They are considered to be the one and only legitimate authority; and with the proof of their detailed records with cadastral maps, there is no need of, or use in, producing any extra witnesses in the court. In such a situation, it is relatively easy to manipulate changes in arable land boundaries and ownership, as many of the people concerned are illiterate and wholly dependent on the revenue officials throughout the whole procedure. In a society where corruption and illiteracy are common, land transaction in public is considered to be the best alternative mechanism for avoiding conflicts and possible future litigations.



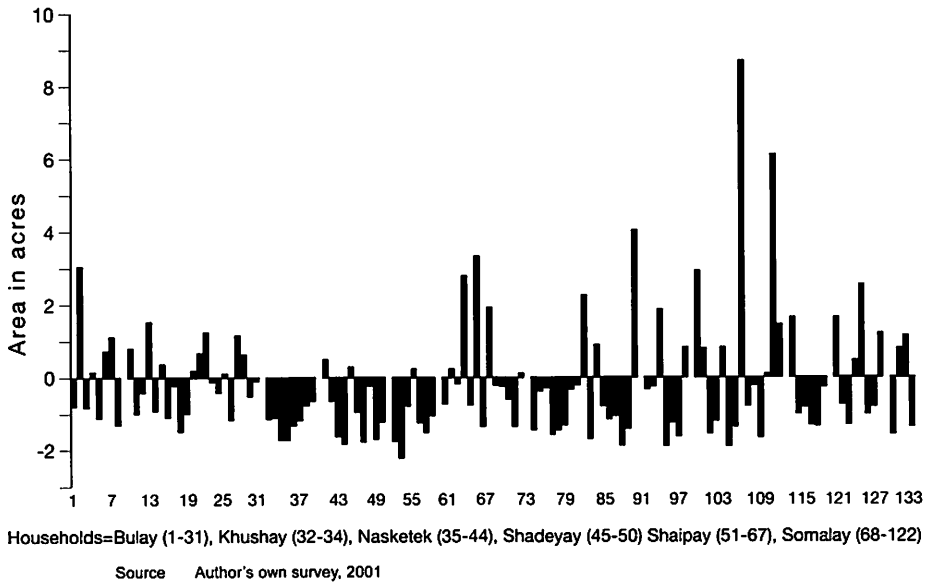
On the other hand, the absence of detailed ownership records makes the commons, or communal land, more vulnerable to encroachment by squatters. There is a higher probability of influential and powerful households occupying common land and ameliorating it on their own, thus substantiating and legitimising their ownership through illegal means. Even in such circumstances, holding the land in private ownership through cultivation or putting it into any productive use is regarded as a sufficient proof of ownership for the courts, according to customary laws. One of the best strategies adopted by the villagers for controlling such forms of encroachment is the allocation of the nearby communal land to a group of households (cf. Chap. 3.4.4.1).

In the study area, there are clearly defined and accepted rules for the allotment of common land to an individual and these rules are followed accordingly. Only the state can grant ownership rights over the common land, but in such cases the village elders or notables are also consulted before conferring ownership on the concerned person. Sometimes the whole community, by mutual consent, can convert part of the communal land into private ownership through developing irrigation channels and equally dividing the land among the stakeholders. In such cases there is no intervention from the state authorities. But if any conflict or dispute arises among the villagers on that land, then the state declares it as 'state land.' In this case, the local inhabitants are eligible to utilisation rights only, and are not allowed to develop the land. Such instances, however, are very rare at the village level. Many cases of this nature have occurred at the inter-village level, as pasture resources became a bone of contention among the neighbouring villages. The common pasture lands were then taken over by the state as it happened in Mehlp valley and other parts of Chital (cf. Chap. 2.2.5 and THE DAWN, May 21, 2002). In such cases nobody is allowed to use them for any purpose except free grazing, as it is practically impossible to control erratic animals.

### **3.2.5 Intra-Village Disparities in Land Ownership/Occupancy**

The societal evolution in the valley seems more or less egalitarian; however, the situation of arable land ownership is highly variable, with wide disparities existing at both inter- and intra-village levels. The main controlling factors are political and historical evolution and growth of a family, as well as availability of water for irrigation. The amount of land area sufficient to fulfil the basic needs of a household varies according to the location of a village. It is estimated that under the current agricultural management practices in the double and single cropping areas of the mountain regions of the Hindu Kush-Karakorum respectively, 1.2 to 2 and 2.5 to 3 hectares of fertile arable land with adequate supply of irrigation water will be sufficient for a household of 7 to 8 members (SAUNDERS 1983: 16). The general ownership level in most of the villages of the region is considered to be well below these estimated figures.

Similar to Punial tahsil (cf. FISCHER 1998: 415f.) there are four different categories of land occupancy in Odier: 1) Most of the arable land has been inherited from ancestors. 2) Simultaneously, many households have also purchased land either from their relatives or from the absentee landlords. 3) Some families have also received arable land from their relatives and ex-landlords as a gift (*hiba*); and 4) many are working as tenants-at-will. In the last case, the tenants are subject to temporal changes, but on the whole the land is available in the village for land-poor and interested households.

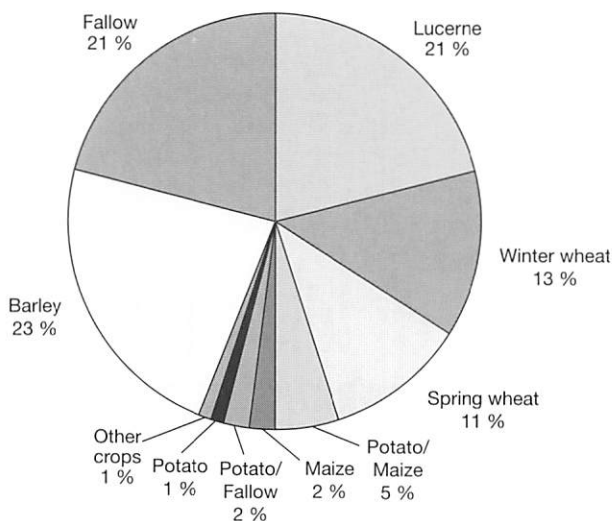


**Fig. 3.4 Odier: Cultivated Land Occupancy Variation from Mean (2.17 Acres)**

According to the filed survey, in the study area, there are no landless households. The average land-holding size (including the land of absentee landlords) is about 2.17 acres. However, holding size varies considerably from household to household, and unlike Askole village in the central Karakorum (cf. MACDONALD 1998: 299), there is also considerable disparity among the different clans residing in the village (Fig. 3.4). Similar to the situation in Puniál (FISCHER 2000a: 68), there is a close relationship between land ownership and immigration/settlement in the village. The three main clans – Bulay, Shaipay and Somalay – are considered to be the aborigines or early settlers (*bumki*) of the village and as such, as in other areas in Chitral (cf. KHAN et al. 1994: 8 and ISRAR-UD-DIN 2000: 65), they own relatively more land and water resources. They have arable land in three different locations: in the lower and upper parts of the village proper, as well as in the summer settlements. They have also held substantial land under clan ownership for quite a long time (cf. Chap. 3.4.3.1).

The remaining three clans – Nasketek, Khushay and Shadeyay – settled in the village later and are therefore considered to be immigrants (*gadai*). They immigrated from neighbouring villages in the Mehlp valley. The Nasketek clan migrated to this village from Mehlp during the reign of AMAN-UL-MULK (1856-1892) and, through the favour of the local *Mehtar*, they received cultivated land here and became influential in the village.<sup>63</sup> Thereafter, using their influence and power, they also encroached on the land of the Bulay clan and forcefully confiscated the house and arable land of one Bulay family. Due to political instability, however, this holding was repossessed from them in under a

<sup>63</sup> One member of this clan also had the good fortune of fostering a son of the local ruler, and thus received arable land in Berzin village in Lutkoh valley. The author met one of the members of this clan in the summer of 1990 during a survey for the Summer Institute of Linguistics, and at that time the clan numbered 29 households (cf. DECKER 1992).



Source Author's own survey, 2001

**Fig. 3.5 Odier: Fields under Different Crops 2001**

year's time.<sup>64</sup> With the exception of two households of this clan, the Nasketeks have no land in the old summer settlement.<sup>65</sup> The Nasketeks were followed chronologically by the Shadeyay clan from Shoat village. They purchased land in the village from absentee landlords and used it as a seasonal settlement. Since then, due to the disintegration of joint-family systems, only three Shadeyay households are practising the old tradition whereby they are considered to be regular households in both villages, i.e. Shoat and Odier. They also enjoy dual access rights to the common property resources.

In this sequence of immigration, the Khushay clan came last. About 50 years ago, the deceased father of the three Khushay households purchased land in the lower part of the village from an absentee landlord from Rayeen and settled here. Neither the Shadeyay nor Khushay clans have land in any summer settlement (cf. Fig. 3.2 and Map 3.2: see suppl.).<sup>66</sup>

<sup>64</sup> Actually, the owner of this house had been in Kashmir on state duty for more than a decade. After the murder of Nizam-ul-Mulk, (1892-1995) the Nasketek clan took advantage of the ensuing political unrest in the state to seize his holdings (cf. Chap. 2.2). This land is now distributed among three Bulay households. The cultivated area is more than nine acres.

<sup>65</sup> One member of the Nasketek clan, the forefather of these two Nasketek households, was the earliest priest of this village. In return for his religious services, the villagers granted him some land with water from the village common in the extreme northwest corner of the summer settlement, and extended the irrigation channel to these plots.

<sup>66</sup> After the amelioration of the former common land in 1989-90, the Khushay did receive a share as a single household, but that is not enough to support three households as a summer settlement. As all of the household heads are working outside the village in state services and business, up to now they have been unable to properly develop their share of land in the newly ameliorated area.

**Tab. 3.1 Field Size in Odier 2001**

| <b>Field size (acres)</b> | <b>Number of fields</b> | <b>Percentage</b> |
|---------------------------|-------------------------|-------------------|
| < 0.1                     | 116                     | 10.8              |
| 0.1 - 0.2                 | 372                     | 34.7              |
| 0.2 - 0.3                 | 303                     | 28.2              |
| 0.3 - 0.4                 | 144                     | 13.4              |
| 0.4 - 0.5                 | 80                      | 7.5               |
| > 0.5                     | 58                      | 5.4               |
| <b>Total</b>              | <b>1073</b>             | <b>100</b>        |

Source Author's own survey, 2001

In this sequence of immigration, the Khushay clan came last. About 50 years ago, the deceased father of the three Khushay households purchased land in the lower part of the village from an absentee landlord from Rayeen and settled here. Neither the Shadeyay nor Khushay clans have land in any summer settlement (cf. Fig. 3.2 and Map 3.2: see suppl.).<sup>67</sup>

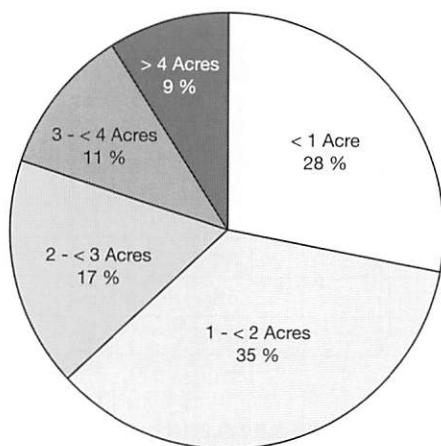
### 3.2.5.1 Distribution of Fields and Field Size

A considerable part of the arable land in all sections of the village is divided into small parcels of various shapes and sizes, for cultivation of different crops. Most of the fields have permanent boundaries and are only occasionally divided into two or more parts for a single season and given to a combination of crops, such as potato or maize, or even left fallow (Fig. 3.5). At the household level, all the fields at each location are subdivided into pools for yearly crop rotation according to their suitability and natural fertility. At the time of this survey there were a total of 1,073 fields in the village.<sup>68</sup> Of these, only 69 fields still belong to absentee landlords. Most of the fields are located in the winter settlement, with 420 in the upper and 261 in the lower part of the village. In the summer settlements, there are only 392 fields.

The mean field size of the village is 0.247 acres, and more than 61 percent of the fields are less than or equal to that. About 75 percent of all fields are less than 0.3 acres, and these comprise more than 52 percent of the total cultivated area. Large-sized fields are quite rare; only 5 percent of the total fields are bigger than 0.5 acres, and these make up only 15 percent of the total cultivated area of the village (see Tab. 3.1).

<sup>67</sup> After the amelioration of the former common land in 1989-90, the Khushay did receive a share as a single household, but that is not enough to support three households as a summer settlement. As all of the household heads are working outside the village in state services and business, up to now they have been unable to properly develop their share of land in the newly ameliorated area.

<sup>68</sup> This is the number of regular fields, and does not include the small terraces of land located within the plantations that are exclusively used for fodder crops. The villagers practise a system of crop rotation in these so-called 'regular fields,' except for the fields under lucerne, which is a permanent fodder crop.

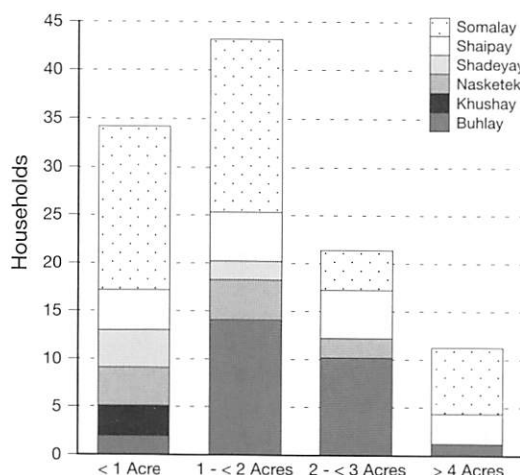


Source Author's own survey, 2001

Fig. 3.6 Odier: Farm Size 2001

### 3.2.5.2 Farm Size as an Indicator of Disparity in Land Ownership/ Occupancy

There are 120 farms in the village, with an average size of 2 acres. On the average a farm consists of more than eight fields, which are distributed in all parts of the village. However, the number of parcels per farm varies from only one field to a maximum of 30 fields. Most of the households own very small farms: 63 percent of the farms are less than 2 acres. Of these, 28 percent have less than one acre (Fig. 3.6). The fact that the farms are located at three different altitude levels, and the average time it takes to walk one-way between two parcels belonging to a single owner ranges from 20 to 40 minutes, further stresses the situation of input supply and care.



Source Author's own survey, 2001

Fig. 3.7 Clan-wise Cultivated land Occupancy in Odier

Breaking down farm ownership by clans is also interesting. For example, all households of the Khushay clan have less than one acre of cultivated land per household.

Similarly, 60 percent households of the Shadeyay clan have less than one acre of cultivated land. However, in case of the remaining households the situation is a bit different. More than 50 percent of the Bulay, Shaipay and Somalay clan households owning less than two acres. Only 20 percent of the total households of the Nasketek clan own more than this amount of land (cf. Fig. 3.7; also Map 3.2: see suppl.).

Due to unprecedented population growth and the ongoing division of arable land among the inheritors, both field and farm sizes are continuously decreasing. There is less and less available land for sale on the market, and since it is more and more expensive, the majority of the households have no financial resources to purchase it (cf. Chap. 5.2.1.). Consequently, the number of households having land below subsistence level is increasing. Home production is only sufficient for about two to six months, and more than 95 percent of the households in this village are heavily dependent on the market for the purchase of food grains and other basic necessities (cf. Chap. 5.2.4).

### 3.2.6 Utilisation of the Arable Land

The land in individual ownership is used to produce food, fodder and fuel, and for controlled grazing of livestock (Map 3.3). The intensity of land use largely depends on the land's altitude, distance from the dwelling, aspect, slope, soil characteristic and availability of water – with water being the most important factor in determining not only the type of crop but also the over-all productive uses. Based on the intensity of use and human inputs, arable land can be divided into two main categories: intensively used land; and barren, uncultivated land. The intensively used land will be discussed here first, in detail.

The intensively used land is locally called (*abad* or *abadi*).<sup>69</sup> This denotes a piece of land that is under the command of some means of irrigation (channel, pond or spring) and is also put to any productive use by the concerned operator. In this category of land, human input (such as ploughing, applying manure, fencing, irrigating etc.) in the form of single or combined activities is a prerequisite for productive output. This land is normally under vigilant and continuous supervision during the whole cropping season, and it is the most intensively used. Here the yield of any product (e.g., food, fodder or firewood) is relatively higher. Due to better yields and limited availability, such land is very expensive and highly valued. In normal circumstances, it is not used for house construction. At present, more than 50 percent of the total area of the village is intensively used by the owners and tenants for various productive purposes.

Part of the intensively used land is given to cultivation of food and fodder crops. In all locations, this land has been divided into fields (*chetur*). Usually each household follows a definite pattern of crop rotation, depending on the holding size and location of their fields, and the households manage their land according to their individual food and fodder needs.

<sup>69</sup> *Abadi* also denotes settlement ensembles (cf. ISRAR-UD-DIN 1966), as well as farming practices; especially ploughing or any crop in general is considered *abadi*.

**Tab. 3.2 Cropping Season in Odier Village**

| Crop         | Sowing                          | Watering                     | Harvesting                 |
|--------------|---------------------------------|------------------------------|----------------------------|
| Winter wheat | September/October               | 7 to 8 times <sup>a)</sup>   | August, September          |
| Barley       | March/April                     | 9 to 10 times                | July, August               |
| Spring wheat | April                           | 4 to 5 times                 | August                     |
| Potato       | May                             | Every third day              | October                    |
| Maize        | May                             | 8 to 9 times                 | September, October         |
| Clover       | September/October<br>also April | Every third or fourth<br>day | June - September:<br>daily |
| Peas         | April                           | 9 to 10 times                | July                       |

<sup>a)</sup> This is contrary to the practice in Hoper Village in the Karakorum, where, according to Burz (1994: 96), there is a relationship between plot size and the numbers of watering during the growing season. In Odier, however, no similar practices have been observed.

Source Author's own survey, 2001

The other important factor in determining crop rotation is the suitability of particular crops. This is connected with the location of fields. It is generally preferred to keep a field fallow for one year (*paran chutk*) after two successive harvests. After that, the particular field is given first to barley, followed by wheat, then it is again left fallow or given to potato/maize in the next cropping season. The marginal areas in both the winter and summer settlements are under lucerne. The main crops are barley, spring and winter wheat, potato and maize (Map 3.4: see suppl.). Vegetables are also grown on limited acreage. The cultivation of millet and other special varieties of wheat has been abandoned since the 1980s. Autumn and spring are the main sowing seasons for food crops. Due to the high altitude, vegetation growth is slow, and crops that need a long time for ripening are sown first (cf. Tab. 3.2.).

### I) Distribution of Barley (*siri*)

Barley is grown in all parts of the village, but the area devoted to this crop is relatively small in the lower and upper parts, where it has to compete with other crops such as winter wheat and maize/potato etc. In the summer settlements, however, barley is the principal food crop. In the past, barley used to be the staple food of the high-altitude villages, but now it is either sold in the market or given to the animals in the winter season. Unlike Laspur valley, where barley is exclusively given to animals (NÜSSER 1999: 111), a few households in the village who cannot afford to buy wheat from the government supplies are still using barley as part of their daily diet.

Cultivation of barley had been reduced substantially due to the availability of subsidised wheat in the high mountain villages (cf. HASERODT 1989a, 1996; MASOODUL MULK 1991; GOP 1999 and STÖBER 2000b). In Chitral town, however, the concentration of Afghan refugees, with their horses, donkeys and other animals (ALLAN 1987a: 2002), as well as the new trend of keeping horses for playing polo in the neighbouring villages has changed this situation.<sup>70</sup>

<sup>70</sup> ALLAN (1984a) attributed all the changes in cropping pattern as well as crop selection by the farmers in the Hindu Kush region of Pakistan to the high influx of Afghan refugees.

In contrast to the negative price adjustment between home production and imported food in Yasin valley (cf. DITTRICH 1997, 1998), in the village of Odier the current market price of locally grown barley and imported wheat are equal; thus it is possible to exchange barley for wheat in like quantity. Therefore, cultivation of barley in the village has increased once again. As a whole, based on area covered, in the cropping year of 2001 barley was covering about 20.6 percent of the total cultivated area of the village. Distribution in the different sections of the village was relatively uniform. Slightly more area was given to barley in the lower part of the village (26.6 percent) than in the upper part (24.5 percent). Although the barley yield is relatively higher in the summer settlements, only 12.9 and 14.6 percent of the cultivated area was given to it in summer settlements of Romolash and Nashtani respectively.

## II) Winter Wheat (*shareq*)

Winter wheat is one of the indigenous crops of the whole Torkhow tahsil including Odier village. Its flour is always preferred for the preparation of traditional and ceremonial dishes. Therefore, all the households of the villages, depending on their holding size and rotation pattern followed, grow it on at least a small section of their fields. It is exclusively grown in the lower and upper parts of the village. Winter wheat takes the longest time for ripening (cf. Tab. 3.2 and Chap. 4.2.3.1). In the summer settlements it is never grown, as it is susceptible to winter season frost at higher altitude. In general, compared to spring wheat the output of this crop is low. Usually the productivity of a single field is difficult to ascertain, because all the sheaves are assembled after harvest in one place for threshing. However, based on the total production figures collected from the households, it seems that the yield is substantially low.

On the average, an ear of winter wheat contains from 35 to 40 grains. Although the straw yield is better than that of barley, the people do not particularly value this usage. As winter wheat is sown on relatively fertile fields, at the time of the survey it was area-wise the main crop in the lower part of the village, taking up 28.2 percent of the total cultivated area. In the upper part of the village, it was third after barley and fallow fields, with 19.6 percent. There is always the risk of total failure of this crop after the long winter season. In such cases, the fields are re-sown and mostly given to spring wheat. In the year 2001, a total of 141 fields comprising 36.558 acres (or 14 percent of the total cultivated area of the village) were given to this crop.

## III) Spring Wheat (*basindi*)

This crop has two main advantages. Firstly, it is a fast-maturing crop, needing only about 150 days to ripen. As such, it is grown in all parts of the village, and is especially preferred in the summer settlements, where winter wheat is not cultivated. Moreover, the second advantage of spring wheat is that it covers the gap created by the total failure of winter wheat – a common occurrence in the village. In the past, spring wheat was a traditional crop, but now many new seed varieties have been introduced in the village. During the cropping year of 2001, spring wheat was sown on 114 fields (10 percent of the total cultivated area of the village). Thus, wheat – including both spring and winter varieties – was the main crop in the village at the time of the survey, with a cumulative acreage of more than 63 acres (24 percent of the total cultivated area).



This corresponds to the general trend in the district and other neighbouring valleys (cf. HASERODT 1989a: 115; GOP 1999: 17 and STÖBER 2001: 112).<sup>71</sup>

#### IV) Potato (*alu*)

This is an important crop, and has even better potential of becoming a major cash crop in the future. At present it is sown mostly for domestic needs, and some of the excess production is sold in the market. Potatoes are sown in spring, in the month of May, along with maize. Mostly these two crops are combined in one field, but sometimes they are grown on separate fields, depending on the holding size and rotation pattern followed by a household. In some cases, potatoes are sown on part of a field while the remaining portion is kept fallow. To achieve a better yield, substantial quantities of manure are also applied.

This crop is mostly grown in the lower and upper parts of the village. Very little area is given to it in the summer settlements, where it is grown only for sporadic daily consumption during the summer season.

The market and food value, as well as the productivity, of the potato is much higher than that of other food crops, and the acreage under this crop is constantly increasing in the district (cf. HASERODT 1989a: 119). Nevertheless, its fodder value is almost zero.<sup>72</sup> Therefore, potato is combined with maize in the lower part of the village to provide for domestic fodder needs, and with fallow in the upper part of the village to maintain soil fertility. Taking into account all of these together, potato cultivation covers up to 16 percent of the total cultivated area. A substantial quantity of potatoes is exchanged and sold in the village, and also transported to the local market for sale. However, due to high transportation costs the net profit is considerably low.

#### V) Maize (*juari*)

This crop is mostly grown in the lower part of the village at about 3,000 m, where the lower village reaches its upper altitudinal limits (cf. HASERODT 1989a: 118). It is not grown widely in the upper part and the summer settlement, because it needs more heat and water during the growing season, and the summer weather conditions are very important for it. Maize is one of the best substitutes for wheat, and also has better fodder value when it is properly managed. Nevertheless, the altitude and size of the land holdings present major hindrances for further increasing the area under this crop. A household with only a smallholding is unable cultivate it every year due to food and fodder constraints, as well as soil fertility. However, in the lower part of the village instead of observing a year of fallow in the yearly rotation system, the field is given to maize to supplement food and fodder production.

Maize is also exchanged for some minor crops, such as green and black peas, with the neighbouring village Mehlp, where it cannot be grown due to high altitude. It is

<sup>71</sup> The importance of wheat among the cereal crops has been reported from the central Hindu Kush, as well (cf. ALLAN 1985b: 15).

<sup>72</sup> Unlike other parts of the Himalayan range, where potatoes are used for fodder purposes (cf. STEVENS 1993: 120f.), no such practices were reported from this village.

primarily used as a main food crop. If considered as a single crop without any other combination, then it was grown on 7 percent of the total cultivated area in 2001.

## VI) Other Crops

Some other minor food crops are also grown in the village on a limited scale. These include vegetables, which may be sown together with either maize or potato in a single field, as a kitchen garden (cf. Chap. 4.2.1.2). Other minor crops – including black and green peas and some pulses – have very limited fodder value, so it is difficult for the households to accommodate them in the usual rotation pattern. As a result, very few households can afford to set aside some land for these crops, and they are grown on a very limited scale only, on marginal field sections away from the dwellings. Although the market value of such crops is much higher than the usual food crops, their unsuitability to the whole traditional farming system and crop rotation is the main deciding factor. Vegetables are also facing the same constraints. Although the soil fertility and weather conditions in the valley are both highly favourable for them, again, their lack of fodder value becomes a decisive factor. In times of shortage, fodder and straw are very difficult to procure in the village, and it is very cost intensive to transport them up from the lower villages.<sup>73</sup> This plays a major role and makes a real difference in making decisions regarding cultivation of a crop and the resultant cropping pattern.

## VII) Fallow (*chutk*)

This is a traditional method for maintaining soil fertility and is considered to be very important within the system of traditional farming.<sup>74</sup> Fallow fields are ploughed without seeds, following a definite system of crop rotation. There are two types of fallow: long fallow and short fallow. Long fallows (locally called *paran chutk* or *parsandi*) are the highly valued fallow fields that are ploughed in spring or summer and left as they are until the next season. Sometimes the natural growth of plants is left, and the field is also regularly irrigated until the fodder growth is matured. Around mid-July, the fodder is harvested and the field is ploughed. In the second case, some fields are ploughed shortly after the harvest of barley, and left fallow for a short period of two to three months. This is called short fallow (*shariq chutk*). Still today the marginal fields are kept fallow for a single season after two successive harvests to ensure a better yield. The growth of weeds is also controlled with this method. As a whole, 21.8 percent of the total cultivated area of the village was kept fallow in 2001. In the lower part of the village, instead of being left fallow, fields are sown with maize and potato, and in the upper part, they are partially given to potato. Therefore in the lower part of the village the fallow fields cover a relatively smaller area; whereas in the upper part, fallow is second to barley in area, and covers more than 20 percent of the cultivated area. In the summer settlements, where high altitude restricts potato and maize cultivation, it occupies a substantially large

<sup>73</sup> For the last decade or so many households have been importing hay and other fodder from the low-lying villages at a high cost. Usually the cost of carriage is more than the real price of the fodder. But there is no other cheap alternative for this, as most of the households are hardly meeting their needs. This is a new phenomenon and the access to regular motorised traffic has made this possible.

<sup>74</sup> The increasing trend of decreasing yields is attributed to the abandonment of this traditional practice (cf. PILARDEAUX 1997:49).

area, second only to lucerne. In 2001, the share of fallow was 33 and 21 percent in the summer settlements of Romolasht and Nashtani respectively.

### VIII) Lucerne (*mushich*)

This is a perennial fodder crop, planted mostly on fields located away from the houses and in summer settlements, those with relatively less fertile soil and limited water availability. The newly ameliorated areas (*nogh pheli* or *nogh phethi*) are always given to this crop. This is a common practice in most of the villages in the Northern Areas and Chitral (cf. MASOODUL MULK 1991; BUTZ 1994; KHAN et al. 1994; NÜSSER & CLEMENS 1996; CLEMENS & NÜSSER 1997; NÜSSER 1998a and HERBERS 2000a); whereas, according to SCHMIDT (2000a: 133), fodder crop-growing is rarely practised in Shigar valley (Baltistan). Lucerne is initially sown in spring through inter-cropping, with either barley or spring wheat as a supporting crop, to keep the soil intact, ease watering and deal with insects. During the first two years, this crop needs more care and regular watering, and for the first and second cutting, special care must be taken not to uproot the plants. Thereafter the mature lucerne, with its stronger, deeper roots, is more drought resistant and also needs relatively less care. In normal conditions the crop remains productive for more than a decade or so, and then it is sown once again. The harvesting schedule in Odier is unlike that of its neighbours. For example, in Rupal valley in the Nanga Parbat region, lying at the same elevation as Odier village, as well as in Yasin and Hunza, the lucerne is harvested three times a year (KREUTZMANN 1989: 110, Fig. 30; NÜSSER & CLEMENS 1996: 125 and STÖBER 2001: 125). Here, in both the lower and upper parts of this village, the crop is harvested twice a year, and in the summer settlements and newly reclaimed areas, only one harvest is made, and the next growth is left for grazing lactating cows.

Lucerne is very well adapted to the local conditions and can be grown on every type of soil, subject to the availability of water. Except for the number of harvests per annum, weather has no effect on its productivity. The crop has a very good nutritional value and also fetches a higher price – not only in the village, but also in the whole tahsil. It is considered to be the best fodder for horses, and its potential market is also increasing in the neighbouring villages (cf. KREUTZMANN 1989: 109). Normally the lucerne is mixed with crop residue for the cattle, and fed unmixed to the sheep during the severely cold days in winter. There are some areas in the village where lucerne is grown predominantly with irrigated plantation. This is mostly the case in newly reclaimed areas, where lucerne is grown in small patches ranging from two to five square meters. The edges and surroundings of these small parcels are given to tree plantations. This combined style of land use covers more than 13 percent of the total arable land of the village. In addition to this mixed cultivation, lucerne is grown in all parts of the village. In the cropping year of 2001, a total of 221 fields were given to lucerne. In area, it was the second largest crop after wheat, taking up 22.1 percent of the total cultivated area. In the summer settlements it was the main crop, sown on the maximum acreage, occupying 36.8 and 53.5 percent of the cultivated areas of Romolasht and Nashtani respectively. Production of a single field is measured in the number of sheaves gathered, and the total production of a household, in the number of loads (*bar*). The number of sheaves per load (*bar*) varies considerably, from five to eight. In the market, the unit of sale is

the sheaf (*bau*). Its cost varies in the village, depending on the season of the year, from Rs. 25 to 30 per sheaf. Many households are earning a considerable amount of money from the seasonal sale of this crop.

#### IX) Red Clover (*shakhtal*)

This is another fodder crop, which has been newly introduced to the village in approximately the last fifteen years. It is grown mostly to supplement the feed of lactating cows in summer. The surplus can also be dried and stored for the winter season. However, this practice is not very popular in the Odier village, because the nutritional value and volume of the clover is greatly reduced in the drying process, and the resultant brittleness of the product causes storage problems. These inherent disadvantages, as well as the clover's susceptibility to insects and pests, are the main reasons for the low acreage given to clover in other areas of Chitral (cf. MASOODUL MULK 1991: 54). In the village, this crop is therefore mostly consumed fresh, during the summer season. Most of the households grow this crop on a small section of their fields, preferably located close to their summerhouses to ease cutting, watering and transport. The clover is sown in both autumn and spring and needs plenty of water. Generally, women cut a small portion of the crop daily, in such a way that by the time they have finished harvesting the area completely, the area first harvested has once again matured. This practice is followed throughout the summer, from mid-May till the end of September. The clover is usually mixed with crop residue to provide fodder. In 2001, this crop was grown on 1.555 acres of cultivated land in the upper and lower parts of the village. Most of the clover fields took up less than six square feet and were combined with other crops in the fields; therefore, it was not possible to record the whole area given to it more accurately.

#### X) Irrigated Grass (*gas/toq*)

As in other villages in the Northern Areas (cf. SAUNDERS 1983; KREUTZMANN 1989: 104; SCHMIDT 2000a: 143 and STÖBER 2001: 115), many of the Odier households own considerable acreage under grass in both the upper and lower parts of the village. A very limited area is under grass in the summer settlements. The grass is partially used for controlled grazing throughout the season, while the majority of the crop – particularly in the lower part of the village – is left growing and then cut at the end of the summer season. This crop is one of the main fodder sources, and produces a considerable amount of feedstock for winter stall-feeding. Like lucerne, the grass is also fed to the cattle mixed with crop residue, and unmixed to sheep and goats. There are two types of natural grass grown in the village. One is found on the natural water drainage sites, either in natural depressions or on land that has many springs and is in a waterlogged condition. This type of grass does not need extra irrigation and is locally known as *toq*. The other type of grass is irrigated regularly throughout the growing season and is generally referred to as *gas*. Sometimes the irrigated grass is also combined with plantation. In such cases, especially when there is a denser growth of trees and other thorny bushes (mainly seabuckthorn), the grass is used for controlled grazing in spring and summer. Some of the field boundaries are also covered by grass, which generally benefits from the overflow of irrigation water (cf. Fig. 4.1). The harvested grass crop is also sold or bartered in the village for other products.

## XI) Irrigated Tree Plantations (*koch*)

Within the territorial limits of this village, except for two small groves of mixed birch (*Betula utilis*) and willow (*Salix denticulata*), there is no area under natural forest. The timber used in constructing the old houses, however, reveals that in the past, there was considerable forest cover in the vicinity of the village. The main types of wood used in the old houses are juniper, willow and seabuckthorn. In one house, almost 60 percent of the wood used is juniper and willow. The absence of poplar as a construction material in the old houses shows that there were no poplar trees in the natural forest at that time. The way timber logs were brought from their source areas – they were dragged – clearly shows that the area under forest was located not very far away from the village.

At present, the forested area is restricted to small patches of juniper, willow and birch trees. All these species are over-utilised and degraded to a very high degree. Although this forest area is relatively close to Odier village, it is exclusively owned by another village (Werkup). The residents of Odier tried their best to obtain formal access and withdrawal rights to the forest, engaging in a long process of litigation, but they eventually lost their suit. On the one hand, this meant that the villagers had no legal access to the woods. On the other hand, the real owners were, and still are, quite far away and were unable to impose any form of control on theft and unauthorised usage. Thus, this forest area became a de-facto open access and was thoroughly overexploited. Up until the end of the 1970s, most of the village households were heavily dependent on this forest for firewood. Due to population growth, over-extraction and mismanagement, however, the forest resources were thoroughly depleted.

Since then, due to security of land tenure and in response to the scarcity of fuel, the Odier villagers, like others, have developed a more sustainable form of agro-forestry on their arable land (MASOODUL MULK 1991, 1992; DENHOLM & JODHA 1992; GOHAR 1994; AASE 1999 and NÜSSER 2001). To satisfy their basic needs of timber and fuel wood, every household has set aside some area of its arable land for irrigated plantation. Usually the marginal and less fertile areas are given to plantations.

The important trees grown under irrigated plantations include various species of poplar, such as *Populus pamarica* (*romenu*) and *Populus nigra* (*terik*), and various species of willow, e.g., *Salix himalaynsis* (*shatelik*), *Salix tetrasperma* (*kantalik*) and *Salix denticulata* (*chikar*). Most of these trees are multipurpose and used for timber, fodder and firewood. Some thorny bushes are also planted and used as fencing material and firewood. Among them, seabuckthorn *Hippophae rhamnoides* (*mirghinz*) is the most important, because of its adaptive qualities and drought-resistance capacity (cf. ZAIDI 1996). Some new varieties of trees, like *Alianthus* spp. (*bakain*), have been introduced in the village. In some areas they are doing well, but in general, their annual growth and second-year survival rate are not encouraging. In most cases, irrigated plantation is combined either with grass or lucerne, where suitable physical conditions permit this, but there are also plantations without grass or lucerne (cf. Map 3.3: suppl.).

Most of the area under irrigated plantation is located in the lower and upper parts of the village, but plantation has also been newly introduced in the main summer settlement, as well. In the past the Romolasht area was used for free grazing in the autumn and

spring seasons; therefore no plantation of any kind was possible there. Later on, free grazing was abandoned and plantation became possible. Only recently a new variety of willow, *Salix denticulata*, *Salix karelinii* (*chikarlishe teli*), from the neighbouring high-altitude villages, has been introduced in this area. The survival rate of this plant is much better than the local variety, *Salix himalaynsis* (*shah telik*), and the yearly growth is also satisfactory. Secondly, seabuckthorn has been introduced in the area. This is one of the best alternatives, since it is inherently self-propagating. Also, it does not need any protection from animals; rather, it protects other plants. However, because of the high altitude and intensive frost, the high-altitude summer settlements are not favourable for the most valuable tree species of the village, i.e., *Salix tetrasperma* (*khan telik*) and *Populus nigra* (*terik*). These are mainly planted in the lower and upper parts of the village. A limited number of apricot, mulberry, apple and walnut trees are also found in the lower and upper parts of the village. Russian olive, *Elaeagnus angustifolia* (*shinjoor*), is another valuable source of firewood and timber, but it is grown only in the lower part of the village. The upper part of the village and the summer settlements are too high for its growth. Therefore, it is not as popular in the village as in other parts of the tahsil.

Generally, every household divides its irrigated plantations into yearly sections, and harvests fixed portions on a rotational basis to ensure long-term fuel and fodder availability. But most of the households do not have enough area under irrigated plantation for the year-round fulfilment of their firewood needs. Thus they are dependent on either the village commons or the firewood resources of the neighbouring villages. A considerable amount of dung is also used in the village as fuel for heating and cooking (cf. Chap. 4.3.3). Moreover, households with enough financial resources buy firewood in the village and also import it from Chitral town.

## XII) Other Uses of the Arable Land

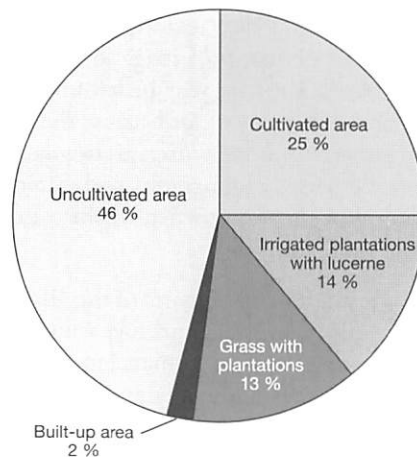
The second category of land in private property is predominantly unused land, known as *ghairabad*, "barren land." This consists first of all of land prone to any natural hazard, bare rock outcrops, rock deposits, steep slopes and areas located beyond the reach of any means of irrigation. *Ghairabad* also includes land, which, although physically suitable and located under the command of irrigation channels, is nevertheless not used for any productive purposes. The land may be left unused either because of water shortage, the high cost of land development, or because the crop grown on it can only with great difficulty be protected from erratic free-grazing animals during the summer season. Thus physical factors, especially topography and water availability, play a major role in the decision-making process of an owner, in this case a household, regarding land development and utilisation patterns.

This type of land (*ghairabad*) is located in all parts of the village. The owner-household generally uses such land for grazing, fodder and fuel wood collection. The output of *ghairabad* land does not require any direct human input for production; the owners must simply collect the products and nominally guard against others' encroachment. The productive capacity and yields of this land are generally very low; nevertheless there is further sub-gradation in yield among the various sub-types within this category. With the passage of time, a considerable portion of this land has been converted into intensive-use land through the construction of new irrigation channels and extension of

the old ones. However, despite high demand and extension activities, 46 percent of the total area of the village under individual ownership is still not available for productive uses (Fig. 3.8).

Due to the above-mentioned constraints, large tracts of arable land in the village cannot be properly utilised for productive purposes. A considerable area in the lower part of the village is prone to landslides: this land cannot be brought under plough because the continuous land movement disturbs any infrastructure, and running water even accelerates this process. Therefore, there is no possibility of changing the existing usage. Xerophytic plants, including wild rose (*throny*), berberry (*choweng*), *Haloxylon spp.* (*patch*), *Acantholimon spp.* (*tholpak*), *Ephedra gerardiana (somani)*, *Eremurus stenophyllus (soi)* and *Artemisia spp.* grow naturally on such areas, and the owner collects them for firewood. Other plants such as *Chammonila spp.* (*shirishtu*), *Eremostachys speciosa (ishloinuku)*, *Iris spp. (ishpur)*, *Rheum ribes (ishpar)*, *Echinops spp. (istrojochun)*, and *Prangos pabularia (moshin)* are also collected and used as winter fodder. The latter, *moshin*, is the main plant that grows on non-irrigated steep slopes. Many households have *moshin* in individual ownership within the territorial limits of the village. The yearly *moshin* production varies considerably, from a single load to more than ten loads carried on a human back. At the same time, *ghairabad* areas are also used for sheep grazing in the early spring and autumn seasons. Aside from these aforementioned uses of marginal land in private ownership, every clan – and in some cases individual families – in both winter and summer settlements sets aside some land as a graveyard (*qabrustan*). In most cases, neither arable land nor land prone to natural hazards is used for this purpose.

In the central part of the village there is a considerable area of land, running in a roughly north-south direction that is covered by large boulders. Within this area, the suitable patches have already been converted into either settlement sites or plantations. Still there is a large tract under rocky deposit that cannot be ameliorated. In certain locations the block piles are more than two meters in depth and consist of huge boulders,



Source Author's own survey, 2001

**Fig. 3.8 Odier: Utilisation of the Arable Land 2001**

so there is no possibility of soil formation and vegetation growth. In other cases, the morphology creates problems because the undulating surface makes the extension of irrigation channels not only difficult, but also sometimes even impossible. In spite of the aforementioned constraints, this land is partially used for productive purposes. It is used for sheep grazing in spring and autumn, and owners also collect naturally grown plants for fodder and fuel wood. Up until now there has been no market for the stones, although they are used locally as building material in the construction of houses and other settlement infrastructures.

### XIII) Roads, Paths and Animal Passageways (*rah, pon, neroun*)

Road, paths and animal passageways are the different types of roads that actually define physical access within the village, and also lead from the village to the pastures. They are named according to their capacity and usage, and include jeep-able roads, pedestrian paths and animal passages, designated according to mutually accepted uses. Despite apparent complexities, these routes are very well defined, and both the user(s) as well as other villagers possess detailed information about them as part of their traditional knowledge, practical experience and consistency of use. Most of the uses are seasonal, corresponding with the agricultural and animal husbandry activities. Some of the access paths, however, do not have any permanent alignment: their course varies both seasonally and annually, depending on the convenience of the users and the owner of the land over which the path runs. In the village, most agricultural products (and other things) are carried on human backs; thus, the alignment of paths and roads is very important. The new buildings that have been constructed in the village, such as schools, shops and the wheat depot, are situated on a normal thoroughfare. The following systems of paths and roads have been identified in the village:

#### Animal passageways

- for sheep and goats to high pastures for daily grazing
- for watering in the winter season and for grazing in spring and in summer

#### Jeepable roads for four-wheeled traffic/ Seasonal footpaths

- access to watermills for grinding grains
- for transporting fodder and firewood from the common pastures
- access for watering crops
- for ploughing with oxen
- for transporting manure to the fields
- for carrying farm produce to the house
- other footpaths for casual use

#### a) Animal Passageways

Animal passageways are permanently aligned paths leading from the different neighbourhoods to the main path (*neroun*), and then to the grazing lands and pastures of the respective grazing-turn groups (*roam*). The animal passageways are used daily, in



the morning to drive the sheep and goats to the pastures, and in the evening to bring them back to their stables in the respective settlement sections. Some of them are used permanently, year round, except in the lower part of the village, where they are closed from the first or second week of June until the end of September. The grasses and any other fodder that grow on them are then harvested at the end of the growing season by the landowner, and the passageways are then reopened. According to the local rules, these animal passageways should be five meters in width, but in reality, they are a scant two meters. In the *abadi* area, these paths are normally fenced on both sides to save crops and other products from animal encroachments. Their alignment is fixed as part of the old usage system, and nobody is allowed to change their route without the consensus of all users. Proper, legitimate access to an animal passageway is one of the main considerations kept in mind while constructing a house on a new site. Usually the animal passages are considered to be general thoroughfares. The users of the paths have access rights only; they cannot claim the benefits of any products grown there. Other animal passageways are used during the winter season for watering the cattle, and the alignment of these paths varies according to the utilisation of the fields. There are also clearly defined paths for moving cattle between different sections of the village.

## b) Jeepable Roads

Jeepable roads are a new development in the last two decades. In most cases, they are not to be used as animal passages, except for cattle. There are cogent reasons for this restriction. The inhabitants have constructed these jeepable roads on a self-help basis, receiving no monetary compensation for their land. Since most of the households had to give productive land for this purpose, they did so only on condition that it not be used for the conveyance of sheep and goats in the future; cattle driving, however, is allowed. Since sheep and goats can be quite difficult to control and tend to be destructive, animal passages generally run through unproductive land – and in any case, animal driving is more flexible than a vehicle. Therefore, to avoid damaging crops, fodder and plantation, the old animal passages are separately maintained. During the last decade or so as threshing machines have become popular in the village, there has been a great development in the extension of jeepable roads. The villagers have a general agreement to help each other in extending the jeepable roads to each neighbourhood of the village. Due to this innovative approach, most of the neighbourhoods in the lower and upper parts of the village, except for a few, are already accessible for motorised traffic. The villagers, according to the prescribed rules, always maintain the main jeepable road leading to the village as a joint responsibility (cf. Chap. 5.7.1).

## c) Other Seasonal Footpaths

Footpaths are very specified with regard to the concerned activities and users: only persons authorised for the particular purpose may use them. Some are used only for watering fields, others for transporting *moshin*, firewood or fodder from the pasture to the winter houses. The width of these paths varies according to the activity for which they are used. The paths used for irrigating fields and driving bullocks on the way to ploughing are narrow, and are also subject to new alignments every year. Other paths are fixed, such as paths leading to the water mills, as well as those used for the transportation of *moshin*, fodder and fuel wood. Nobody is allowed to drive sheep and goats

on these paths, except in emergency situations or with the prior permission of the concerned households.

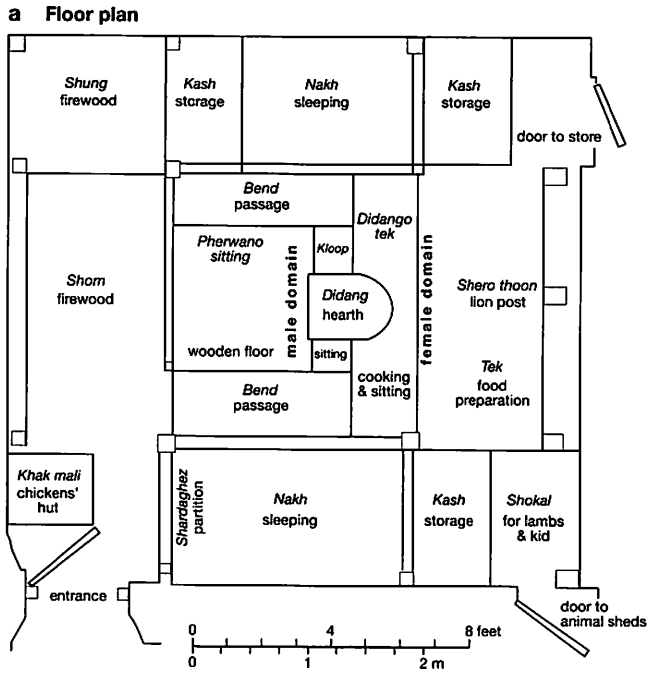
Roads and paths are among the main considerations at the time of land transfer. On these occasions, all concerned households make sure to be present in order to legitimise their own use. These rights are also mentioned in the written testimony (*sanaad*), which specifies the uses of each pathway in detail, as well as other parameters (cf. Chap. 3.2.4). As in other mountain villages (NETTING 1976: 142), the physical access (recognised path) to a field or arable land parcel is of paramount importance, and nobody will purchase a piece of land without a definite and clear access to it from his dwelling. Every household knows all the routes and paths leading to its land, as well as those passing through its land, along with all other relevant details of rights and usage.

#### XIV Settlements (*dur/deh*)

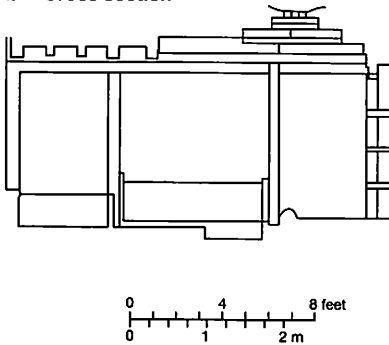
The ubiquitous availability of water in all the villages of Mehlp valley, together with the owners' preference to build their houses close to their own land parcels, has created a pattern of widely dispersed settlements throughout the whole Mehlp valley (ISRAR-UD-DIN 1966: 26). There are more than 240 houses in the village. In the lower and upper parts, there are 38 named neighbourhoods. The origins of these names, in many cases, sheds some light on the village history and earlier land ownership patterns (cf. ISRAR-UD-DIN 1966). In most cases, however, these names relate either to landforms, or to the location of the neighbourhood with reference to the landforms. For example, settlement names with prefixes and suffixes like *Tek*, *Dok*, *Kulum*, *Kham* and *Der* all denote different physical characteristics of the particular sites. On the other hand, the clan name used with the suffix *dur* – as in *Shinan dur*, *Bizan dur*, *Rizan dur* or *Baikay dur*<sup>75</sup> – clearly demonstrates the old land-ownership by the respective clans in these neighbourhoods.<sup>76</sup> The number of houses per neighbourhood varies from one to more than ten. Initially a single clan occupied all of the neighbourhoods, but later on, due to land transfer, some of the neighbourhoods became more mixed (App. 9). The situation in the main summer settlement (Romolasht) is a little different than in the winter settlement. Here there are 15 named neighbourhoods, and while the composition of households in each section varies according to the location; usually a single clan dominates in every named neighbourhood (App. 10).

<sup>75</sup> Rizay is one of the notable (*adamzada*) clans in the area. At the present time, however, there is neither a single household of this clan in the village, nor does the land associated with their name belong to them any more. The only possible explanation is that they were at one time the owners of either part or all of the land in this section of the village. They then either sold their land or it was confiscated from them by the *Mehtar*. The same is the case for Baikay, who also belong to the *adamzada* clans of the former state of Chitral. In both cases, some or even all the land of the particular village section, or *dur*, still belongs to outsiders. There are other *dur* in this village where the land was, and still is, owned by outsiders, such as *Shinan dur* and *Adino dur* etc. In these cases, the present name has nothing to do with the ethnic affiliation of the new owners.

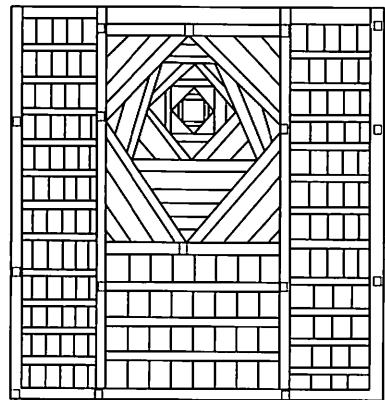
<sup>76</sup> The Bizay and Shinay clans no longer exist in the valley. Nevertheless, in the case of the former a neighbourhood called Bizang duri exists in Warijun village of Mulkhaw tahsil (BAIG 1997: 169).



**b Cross section**



**c Reflected ceiling plan**



Source Modified from POTT (1965)

**Fig. 3.9 Odier: House Design and Layout**

Other settlement structures of the village in communal ownership include eight water mills, located below the village along the main perennial stream. One micro-hydel unit has been constructed with the financial and technical support of AKRSP (cf. Chap. 5.6.1). There are twelve mosques in total, six each in the summer and winter settlements of the village. In 1992, the villagers constructed a wheat sale-point in the lower part of the village. The only building constructed by the government is the boys' primary school in the upper part. This was established in 1972 as an open-air school.

In all neighbourhoods, houses are generally situated more or less in a line, with the entrances all-facing in one direction; preferably southwest, and attached animal sheds in the back. Except for some isolated houses, most of the households in a neighbourhood share at least one common wall, either as part of the house or the animal shed; thus the roofs are joined together, without any space in between (cf. HASERODT 1989a: 94). This linear pattern of houses facilitates the daily movement of livestock for outdoor grazing, as the stable outlets are always close to each other. Communal- or independently owned threshing floors are located in the vicinity (cf. HASERODT 1989a: 112), sometimes consisting of a large roofed-over veranda-type structure, having walls on three sides (*lawar*) (cf. ISRAR-UD-DIN 1965: 138) and open in the front, towards the threshing floor. Generally, a small mosque without minarets is also located in the neighbourhood. There are also graveyards sited in the vicinity of the built-up area, which in turn is usually surrounded by fields and plantations.

The main component of settlement ensembles in this village is the typical single-room house (*khovar khatan*) with its attached infrastructure. Its ground plan is comprised of different sections with specified uses for male and female family members (POTT 1965; ISRAR-UD-DIN 1965, 1966, 1984; HUSSAM-UL-MULK & STALEY 1968 and HASERODT 1989a).<sup>77</sup> The scarcity of timber, the long and extremely cold winters and the local earthquake hazard are considered to be some of the driving forces that influenced the evolution of this typical house design in the region (Fig. 3.9).

The normal *khovar khatan* is approximately eight by seven meters in size. This single room, along with its associated structures, is used for sleeping, sitting, cooking and storage. The animal quarters are attached to it, with a direct access. A storeroom is also attached, called (*duro gonj*) to distinguish it from the milk storeroom, which is also called *gonj*. The former is almost three times bigger than the latter, and is always attached to the house (Fig. 3.10). In contrast to this, the milk room is constructed separately, as an independent unit, preferably close to water or in a shady place to keep the milk cool during the summer season. There are additional storage facilities inside the house for grain and flour. These cube-shaped structures (*kash*)<sup>78</sup> are constructed next to the sleeping places, from sun-dried clay bricks and two big flat stones. One flat stone is placed on the bottom; four clay-brick walls are erected up to about one meter in height; and then the other stone, with a hole about 23 cm in diameter in the centre, is placed on top of these walls. To cover this hole, another stone, especially prepared for this purpose, is placed over it. These storage structures vary in number from house to house, from four to six. Some of these storage structures are also constructed in the attached *duro gonj*. In normal circumstances, one *kash* is reserved for barley flour, one for wheat flour, and two for the respective grains. These were traditionally the only means

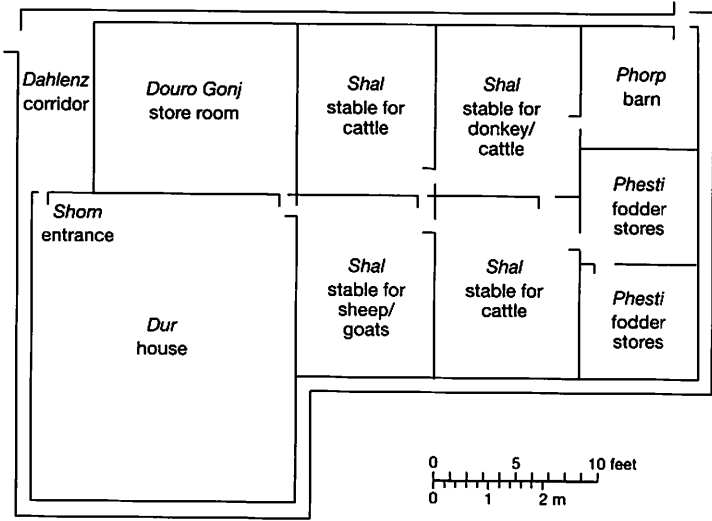
<sup>77</sup> The authors present a detailed description of the house design and layout used by upper-class people, commonly known as *baipash* ("state house"). The general populace has added some additional facilities for storage to this basic design, depending on the location of the settlement. ISRAR-UD-DIN (1984) also classified the houses according to style and building material. But the overall descriptions in these articles lack a detailed account of the high-altitude houses that are seen in this valley under study.

<sup>78</sup> This type of grain storage inside the house has been reported in Ojhor valley of Lotkuh tahsil, as well (SCHOMBERG 1938: 104).

for storing grain and flour in the area. In the past, such structures were also constructed underground to safeguard valuables from plunder. The underground *kash* were known as *bum kasho*, which literally means “underground storage” (BAIG 1996: 142). These were entirely different from the shallow pits (*setini*) constructed for the storage of potatoes in the winter season. The *bum kasho* were constructed by using four slabs of stones, one on each side, to store grains safely against raids and plunders from outside.

In the winter, a square-shaped opening on the roof (*komal*) serves as an outlet for smoke. The *komal* is usually closed at night when all the billets have been burned and there is no more smoke left in the hearth. A small square-shaped cover is made, depending on the size of the *komal*, from long straws of wheat. The straw is held together by three strips of wood, over and under in three places – the two edges and the centre – and tied together at the edges either with ropes or other material. A long handle that hangs down into the room is attached to the central wooden band, enabling the inhabitants to close the cover simply by drawing the handle down. The handle is pushed up to remove the covering in the morning, and open the smoke hole. This routine is usually practised from December until the end of February, to keep the living room warm. Other openings in the animal sheds are likewise closed with coverings, and old cloths are fixed over the doorways and wall joints. Despite these efforts, the room temperature falls below freezing during the extremely cold period.

The housing situation in the summer settlements is entirely different. There, houses are built to be more isolated, and the resulting loose-knit neighbourhoods are generally diverse, consisting of different clans. The houses are small and low in structure, with small doors. The overall ground plan is similar to those of the winter houses, but the ceiling plan is entirely different. They resemble stables more than houses, and thus have been classified as *shalma* (cf. ISRAR-UD-DIN 1984). This is a practical solution, due to



Source Draft and drawing, Fazlur-Rahman 2003

**Fig. 3.10 Odier: House Plan with other Associated Structures**

the shortage of timber and other resources, and is workable since these houses are only used during the summer season. Other building structures in the summer settlements are byres (*shal*), fodder stores (*phesti*) and one milk room (*gonj*) per house. Here the byres are detached from the living rooms, but the milk room has a direct access from the house. Households that spend more time in the summer settlements have improved their houses significantly in structure, design and provision of space. Some households have also attached a crude type of guestroom to their houses, to accommodate their household members. People also use the roofs for sleeping in the summer settlements, but in the main houses this tradition is now dwindling.

### **3.3 Summary: Ownership and Utilisation of Arable Land**

As a general practice in the mountainous areas and elsewhere, the most productive, (high-quality) agricultural land is always kept under individual ownership, and in this case, it is owned by a household head. Since arable land is a principal source of subsistence, it is used intensively for the production of basic household needs, keeping in mind crop suitability and long-term productivity of the fields located at different elevations. Locally devised farm management practices are usually oriented to ensure a certain degree of self-sufficiency in agricultural products, without compromising the fertility of the acreage. The regular supply of manure and crop rotation, including fallow seasons, are the main traditional strategies for maintaining land productivity. The importance of fodder and firewood (for cooking and heating purposes) – and their limited availability, which is the direct result of physical constraints – can be observed in the cropping patterns and land utilisation in this village. Depending on land-holding size, relatively more area is consistently given to fodder crops, pastures and irrigated plantations. This is particularly the case in newly reclaimed areas and arable land located far away from the dwellings. Irrigated plantations are divided into blocks, and harvested on a yearly basis to ensure the availability of firewood. Likewise, the privately owned pastures are carefully used for seasonal controlled grazing and haymaking. Moreover, this land-use system clearly highlights the importance of animal husbandry and its relevance to farming practices in this village.

Both inheritance and tenancy systems are organised according to customary laws and traditional practices. In the absence of detailed land ownership records, land transaction is carried out in public, in the presence of close relatives, neighbours and village elders. Additionally, in accordance to the customary laws, minimal records are kept not only for the piece of arable land in question, but also for all other related resources and relevant infrastructures. This includes such extras as water shares and entitlement to, and usage rights of, different roads and paths leading to that particular land. Because of the economic importance and general scarcity of relatively fertile land, houses and other structures are not built on such land, and a regular field is never given to such uses. However, despite new land development and purchase from the absentee landlords, land ownership and occupancy of cultivated land by a household is rapidly decreasing. With a growing population and the resultant establishment of new households, not a single clan or household is self-sufficient for food, fodder and firewood production. Consequently, dependency on the common property resources for the provision of fuel and fodder is constantly increasing.

### 3.4 Common Property

All common property resources share two fundamental characteristics: 1) the exclusion (or control of access) of potential users to these resources is problematic; and 2) joint use results in subtractability (cf. BLAIKIE, & BROOKFIELD 1987; BERKES et al. 1989; BERKES & FARVAR 1989; OSTROM 1990; SCHLAGER & OSTROM 1992 and OSTROM et al. 1999). In order for a common property resource management system to function successfully, several factors must be included: its boundaries must be clear; the user group must be fixed in size; and there must be an institutional arrangement for formulating rules and implementing authority. Equity in the distribution of resource units and a conflict-resolution system are also necessary for long-term operation and resiliency (OSTROM 1990, 1992). Likewise, failure of the common property system can also be attributed to the malfunctioning of the above-mentioned conditions. How resource units are allocated among the co-owners and the management mechanisms used vary in common property systems, depending on the nature of the resource and its economic importance for the survival of a community.

#### 3.4.1 Common Property Systems in Mehlp Valley

In Mehlp valley, three resources are utilised and managed under a common property system: irrigation water, fodder and firewood. All the nearby pastures of the individual villages within Mehlp valley are permanently reserved both for firewood collection and haymaking. For proper utilisation and management both of these resources, local officials (*darophal*) are appointed for an indefinite time period to control, but the distribution of these two is handled differently. In the case of firewood, equity is always maintained in the distribution of resource units (amount of firewood). The whole pasture area is opened for a limited number of days yearly for the extraction of firewood (see below). This is always done in consultation with the village officials. In the case of hay fodder, however, there is no mechanism to ensure equity. Similar to the practices in other areas (cf. NETTING 1976; GILLES, HAMMOUDI & MAHDI 1992 and MCKEAN 1992b), the concerned pastures are also formally declared open for haymaking, but without any time limit. The co-owners are then allowed to extract as much fodder as possible. The distribution and use of irrigation water is a bit different still. The water is also considered to be a common property resource for a limited number of households who either have land under the command area of a channel or who are otherwise entitled to it. In any case, the shareholders of an irrigation channel are considered as a single group, and they have fixed shares of water in terms of time and volume (cf. Chap. 3.4.3.2).

The de-facto ownership of the pastures, not only in Mehlp but also in the whole region, differs depending on their location and historical utilisation patterns. The absence of written records has created confusion in the past, especially in the demarcation of boundaries between and among the nearby villages throughout the district. This situation has often been a cause of inter-village conflicts and litigation for access rights. In a region with both very limited and uncertain resource base and decreasing arable-land ownership, this will remain a potential cause of future conflicts. However, the general

principle of pasture ownership in the former state of Chitral has been attributed to the following factors: settlement hierarchy, location of a village and the system of taxation:

*“The main settlement unit is the oolat or village... They are generally isolated from one other by such physical boundaries as watersheds, interlocking spurs, ridges and rivers. An oolat possesses a common pasture and has a village Kamati or committee to regulate affairs. This unit is also often assessed for collecting ushar (taxes)... The villages in tributary valleys and on small alluvial fans differ in respect of their social and territorial organisation. The whole valley is considered as a single oolat. Pastures are common to the whole valley and the Kamati is also appointed for the whole valley.”* (ISRAR-UD-DIN 1966: 26, 28) [emphases added].

Meanwhile, the existing ownership patterns of pastures and pasture resources are closely related to the historical evolution of property rights, settlement history, ethnic structure and old usage patterns (ISRAR-UD-DIN 1995b; FAIZI 1999 and NÜSSER 1999: 125). During the *Mehrar* period, all the important tributary valleys and high pastures, like the arable land, were game reserves for the royal families and local notables. The common people were granted only usufruct rights for the pasturage and extraction of fodder and firewood. The primary condition for withdrawing these resources was being a regular resident in a village, working on the state land in a capacity of a *rayat* (state tenant), or being the tenant of a landlord, *dehqan* or *shirmooz*. Moreover, like other villages in the Northern Areas of Pakistan (cf. HEWITT 1989: 347; FISCHER 2000a: 62; KREUTZMANN 2000a: 94f.; POLZER & SCHMIDT 2000: 185 and STÖBER & HERBERS 2000: 52), these pasture and grazing grounds were one of the main sources of state revenue for the respective states.

Practically however, the whole situation of ownership and utilisation of pastures and pasture resources was and still is different in the case of Mehlp valley, where all three villages – namely Odier, Shoat and Mehlp – have their own pastures with fixed territorial boundaries. Despite the fact that ownership of pastures was and still is de-facto in the whole Torkhow tahsil, the individual villagers can collectively ameliorate their pastureland and change the ownership status without any prior permission from the state. Moreover, for quite a long time they have been utilising these pastures under a decentralised communal-management system, with mutual trust and forbearance for the secondary rights of the neighbouring villages, without any reservations.

At the local level, farmers' dependence on the common property resources is increasing. Various factors are responsible for this phenomenon, including population growth, fragmentation of arable land and increasing numbers of livestock. The conversion of former grazing grounds in the vicinity of the village into arable land has further increased pressure on the commons (cf. Chap. 5.6.1). Both rich and poor (in terms of land ownership) are equally dependent on these resources for different products, but those households unable to produce the required amount of fuel and fodder from their own private holdings are entirely dependent on it (cf. JODHA 1986). Simultaneously there are other external factors, such as modernisation and globalisation, which are indirectly affecting the entire socio-economic set-up by undermining both the authority of the



local institutions as well as small-scale handicrafts. These negative impacts have sometimes adversely affected the traditional livelihood patterns of specified groups:

The opening up of these [Karakorum, Himalayas and Hindukush] areas and the resulting flood of cheap imports have adversely affected many artisan classes who are forced to find land for cultivation and depend even more on the common property resources. (BANSKOTA 2000: 92)<sup>79</sup>

### 3.4.2 Access, Withdrawal Rights and Appropriation of Resource Units

Within a user group, access to resource units usually varies. Depending on the value of a product, the household (not the individual) is the agreed-upon shareholder unit (cf. MCKEAN 1992a: 74, 1992b: 258). All the descendants can inherit equal shares from the commons, except in the case of irrigation water. Unlike the situation in Punial tahsil (FISCHER 2000a: 61) and Astor valley (CLEMENS & NÜSSER 1994: 380, 1997: 240; CLEMENS 1997: 108; NÜSSER 1998b: 327 and FAZLUR-RAHMAN 1998: 101, 2000: 72), where access to the pasture and its resources is generally determined by land ownership in a village, in Odier the access rules are more complex. Here a villager or co-owner must, first of all, be physically present, living as a resident member of an independent household (*khushon*) in the village. As well, he is obligated to participate in various socio-economic activities and rituals. These are the two main prerequisites that validate his appropriation rights.

Moreover, in order to retain his valid access rights, he has to comply with the rules and fulfil all his required responsibilities as a member in a common property regime. These rights to the common property resources can only be transferred by inheritance; they can neither be sold to nor purchased from anybody else.<sup>80</sup> This rule applies in particular to the absentee landlords: even if an absentee landlord sells his entire agricultural land to an already existing resident household in the village, he cannot sell his access rights to any common pool resources (except irrigation water). Neither the tenants nor the person who purchases all the land of an absentee landlord may claim an extra share from the village commons.

If, however, an outsider purchases such land and settles in the village as a regular household (*khushon*), then the concerned person is entitled to equal access and withdrawal rights to the concerned resources at both levels – as resource user as well as villager. If the absentee landlords or their descendants later resettle in the village, they also regain their access rights.

In the past, many households who left the village and became tenants in other parts of the district temporarily lost their access rights. Upon their return – after they resettled in the village and resumed their duties and responsibilities as a regular household – their access rights to the village commons were automatically restored.

<sup>79</sup> On the influx of industrial goods and their negative impacts on the village artisan in Chital see HASERODT (1989a: 151).

<sup>80</sup> Similar practices have been reported from Uganda (cf. ADEGBOYE 1971: 71).

Another example can be seen in the immigration of a few households<sup>81</sup> from the neighbouring village Shoat. They purchased arable land from the absentee landlords and settled in the village as regular households (*khushon*), and since then, they and their descendants have equal access rights to the village commons in both categories.<sup>82</sup>

In the absence of written records, access rights to pastures and pasture resources are more complex. The pastures are used for different purposes, such as free grazing of cattle and yaks, seasonal turns for grazing sheep and goats, collection of firewood and fodder etc. In the existing utilisation system, the access rights of the neighbouring villages have been accepted for specified uses and the extraction of a few resources (cf. Tab. 3.7).

### 3.4.3 Land in Clan Ownership

In the past, the principal clans of the village – Bulay, Shaipay and Somalay – owned arable land in the vicinity of their respective neighbourhoods. It was marginal land and was not suitable for crop cultivation. Most of this land was located above the command area of existent irrigation channels. It was treated as a common with well-defined boundaries and, in principal, only the clan households had access rights for utilisation. It was not a reserved area (*sag*) for the extraction of resources; rather it was an open access for all clan members. In some cases, other households also had limited access rights, e.g. for seasonal sheep grazing. The common land was mostly used for firewood and fodder collection, and for livestock grazing during the summer season. As these areas were located very close to the dwellings, children were the main users, collecting both firewood and fodder. Although both poor and well-off households benefited from this land, the land-poor households were more dependent on it for the collection of firewood and haymaking.

#### 3.4.3.1 Grazing Land in the Vicinity of the Arable Land

The Somalay clan had (and still has) the largest area under this category of ownership, comprising approximately 126.5 acres, located in the upper part of the village. Part of this area was under the command of old irrigation channels. Later, a new irrigation channel was constructed for the uppermost part of the land, and a summer settlement with cultivation was founded there. Since then, the whole area has been systematically reclaimed and taken under private ownership. This area is physically suitable for fields, and has therefore been mainly given to food and fodder crops. More than 40 percent of the total area, however, has been given to tree plantations. *Salix himalayensis* (*shatelik*), *Populus pamirica* (*romenu*) and *Hippopace rhamnoid* (*mirghinz*) are the most important trees that were planted here. There are a few *Salix tetrasperma* (*kantalik*), but the area is

<sup>81</sup> Initially four households immigrated from Shoat and purchased land in Odier about two generations ago. They belonged to the Khushay and Shadeyay clans. Now, both clans have increased to three households each. The Khushay clan no longer owns land in Shoat, but Shadeyay clan has land in Shoat as well as Odier. Therefore, they are considered regular households in both villages, and thus have access rights to the resources of the respective villages.

<sup>82</sup> This is contrary to the situation in Törbel (NETTING 1976: 139), where “Ownership of a piece of land did *not* automatically confer any communal right (genossenschaftliches Recht).”

not suitable for *Populus nigra* (*terik*). Almost 90 percent of the total area has been developed in this way. The rest of the land is either hazard prone or too steep to extend the irrigation channels that would convert it into arable land. Nevertheless, this remaining portion is also held in private ownership. This development and change of land ownership put an end to the possibility of collective sheep grazing in this area.

The land of the Bulay clan is located between the upper and lower parts of the village, on both sides of the natural drainage, and covers about 25 acres. There were originally many springs facilitating vegetation and grass growth there, but the water of these springs was diverted into an irrigation channel to irrigate arable land in the vicinity of the dwellings. This was a regular channel with fixed water turns for the users. Since the water had already been diverted for irrigating fields, there was no longer any practical possibility of constructing an irrigation channel for the Bulay clan's area. In response to a severe drought in the mid-1970s, however, the villagers constructed an extension to an old irrigation channel, the Golo zhoi, giving it a new alignment, and thus the original spring water was no longer being diverted (cf. Chap. 3.4.4.2). As a result, sporadic and individual land development started in this area in the early 1970s, and around the mid-1980s the whole area was formally divided and distributed among the households of the clan. After this change in ownership status, land development was very rapid, and today the area is totally given to fodder and plantation. Many households also sold their shares to non-owners, and once again the wealthy households of the village benefited from this process.<sup>83</sup> Before the change in ownership, most of the land-poor households of this neighbourhood were dependent on the communal land for seasonal livestock grazing and firewood collection. Now they are strictly confined to their own land parcels for the above-mentioned activities.

In this area, the distribution of trees is quite similar to the area of the Somalay clan, except for the additional plantation of russian olive (*sinjoor*). Due to the undulating nature of the surface and infertile soil, there was no possibility of making regular fields for food crops. Before the distribution of this land, many non-owners from the Nasketek clan also made encroachments here. At the time of this survey, the Bulay clan households each occupied approximately one acre of arable land.

The arable land of the Shaipay clan is located at two sites, one in the upper and one in the lower part of the village. Their arable land in the upper part of the village is located just above their cultivated land. Altogether it covers approximately 100 acres; however, rock deposits and undulating surface cover more than 40 percent of the total area. There are only two springs in the whole area and originally no other reliable source for the construction of an irrigation channel existed. There was a small pond just above this area, however, which was a potential source of irrigation. This area was originally used for sheep grazing in spring and summer, and one section of the village used it as a winter pasture for grazing goats as well. Following a major realignment of the channel through this area, sporadic land development started (cf. Chap. 3.4.4.2). Then during

<sup>83</sup> Usually a change in land ownership from communal to individual favours the relatively rich households in a village. These wealthy households have different means – e.g. political, social etc. – at their command that enable them to extract maximum benefits from this process. Such events are quite common in the mountainous areas (cf. BROWN 1999).

the 1990s, most of this area was converted into individual ownership. Since then, almost 20 percent of this area has been developed and is exclusively given to fodder crop (lucerne) and plantations. Consequently, the seasonal sheep grazing here has become relatively difficult.

The distribution of this land among the clan members was neither systematic nor made with proper arrangement. Every household went on its own and demarcated land for itself. Nevertheless, since most of the households have enough cultivated land, there were and still are no disputes among them.

The Shaipay clan's second parcel of land in the lower part of the village is located below the cultivated land, and extends down to the stream. It was already developed and kept in two different ownership regimes: individual households held the fields, and the area under grass was a common property of the clan. The common property was mostly used for seasonal livestock grazing, and only two small parcels of grass were harvested by the clan on a rotational basis, following the principles of *moshin* management (see below). Due to excessive mass movement and down-slope sliding, about 80 percent of this lower parcel of land has been eroded by the stream. The communal area is already eroded, and most of the individually held fields either no longer exist or are lying barren; they could not be cultivated for more than the last two decades. About 50 percent of the households of this clan have already lost their cultivated land here. This process is still actively ongoing, and a portion of the remaining valuable land is eroded every year. In such a situation there is no possibility of any intensive use, and the area is used exclusively for seasonal livestock grazing and fodder collection.

#### **3.4.3.2 Clan Level Distribution and Management of *Prangos pabularia* (*Moshin*)**

*Prangos pabularia*, locally known *moshin*, is one of the perennial plants generally used for fodder purposes during the long winter stall-feeding in Torkhow. It grows at an altitude of about 2,900 m both around the arable land in the high-altitude villages and summer settlements, and in the high pastures. It is a drought-resistant plant with an exogenous origin (NÜSSER & DICKORÈ, 2002: 50), and generally does not need any care or protection. However, long-term drought conditions do have a negative impact on its productivity. It has a self-protecting mechanism that ensures that animals do not eat it during the growing period; its propagation is natural and self-sustaining. Its colour changes from green to yellow in late summer. It needs special sickle and cutting techniques and bundle making is also different from other fodders (cf. Chap. 4.2.2.1).

*Moshin* is normally assessed according to the morphology of the area where it grows, the plants' density and the total number of loads per annum. There are some additional seasonal yardsticks based on the composition of leaves and stems in plants sharing a single root, and their height is also considered. These qualitative criteria affect the amount of labour input necessary for cutting, gathering and transportation, as well as the fodder quality and yield. The composition of leaves and stems is very important, as this fodder is the preferred feed for sheep and goats, and they can only eat the leaves. According to the local inhabitants, the nutritional value of this fodder is low; however, they value the *moshin* highly for the better quality of manure it yields.

All the principal clans have their *moshin* in the main pasture of the village (Khotocho gol). These *moshin* plots are located contiguously to each other, with different landmarks serving as boundaries for defining clan ownerships. The individual households or families of each clan have their *moshin* within their own clan's area. Cutting, assembling and transporting the *moshin* down to the winter houses is labour intensive, and for a household with insufficient male labour force at hand, it becomes relatively expensive. Most of this work is carried out with the help of relatives and neighbours under the umbrella of non-reciprocal labour sharing (*yardoyee*), and altogether, the labour inputs are higher than the output. Because of this, *moshin* was not highly valued in the recent past; however, with the passage of time the situation has totally changed. Due to the increasing numbers of nuclear families in the village, there has likewise been an increase in the livestock population and a corresponding decrease in the yield of forage for haymaking from the village pastures. Therefore this fodder has increased considerably in value. Moreover, the division and fragmentation of the arable land in the village has also contributed to a decrease in each individual household's fodder production. Consequently *moshin*, once a neglected fodder resource, has become more valuable, and now the villagers are buying and harvesting it, even from far off areas. Thus it has become an expensive item for sale, and the absentee landlords and other neighbouring villagers who own *moshin* plots in the vicinity of this village have really profited from this situation. Basically individual households own *moshin* according to the prevailing inheritance law, which in principle says the *moshin* must be equally divided among the inheritors – but this has become problematic. As a fixed resource spread over relatively large areas, *moshin* needs much time and labour for cutting, collection and transportation. Therefore, the fragmentation caused by splitting up joint family holdings is extremely uneconomic. To avoid this problem, at present this fodder is regulated by ownership and management systems at two different levels: by family and by clan.

The absentee landlords also own *moshin* as a complementary part of their arable land. In general the traditional tenancy system does not include the *moshin* grown in the pasture as part of the land property located in the village. Therefore the tenants who need *moshin* for fodder are additionally bartering sheep or goats with their landlord for the privilege of harvesting his *moshin*. The landlord has the right to sell the yearly harvest to someone else for payment, or to rent his *moshin* to somebody on a long-term basis (cf. Chap. 3.2.3). When a landlord sells his whole arable land in the village, then his *moshin* (if any) and water rights are sold together with the land and mentioned in the land transaction document (*sanad*) (cf. Chap. 3.2.4). As a permanent fodder resource held in individual ownership, *moshin* can be sold to or purchased from others on a permanent basis, as well.

The ownership of *moshin* in the pasture has nothing to do with the ownership of the land on which it grows. According to the customary laws, the *moshin* owner is neither allowed to extract other fodder nor firewood from this land; his ownership right is restricted solely to this single fodder. As already stated, most of the *moshin* areas are located in the nearby communal pastures, which belong to the village. However, some of the households also own *moshin* in the pastures of neighbouring villages. In all circumstances, the de-facto land ownership is either vested in the village of a *motion's* owner or in other villages. In any case, *moshin* belongs to the respective household or

clan group – whatever the case might be – irrespective of the land tenure. This general rule of customary law prevails in most villages of the whole Torkhow tahsil. It is so strongly followed that in cases of court litigation over pasture ownership and access rights between two villages, the testimony of *moshin* ownership has never been accepted as a proof conferring access rights to any other resources, including land ownership.

Details of *moshin* management clearly follow the genealogy and development of clans or families. In most cases, the distribution system used today is the same system that was devised and promulgated in the past. The co-owner households of a clan were divided into primary groups in a rotational cycle with fixed shares, i.e., a fixed number of loads. With the passage of time, new members were added to the respective groups, initially through the splitting of the joint families. The further increase in population (i.e., the establishment of new households) in the respective primary groups created secondary groups, and the more recently, tertiary groups. In the meantime, permanent out-migration of family members has also affected the existing distribution system and entitlement of the respective households. With the increase in population and formulation of new tertiary groups, not only are the shares decreasing in quantity, but also the length of time needed to complete a rotation cycle among the households is increasing. However, the resource as such is intact, without overexploitation. This is due to the fact that only a limited number of households have access and withdrawal rights every year. This whole management system, formulated in the past, is still running quite smoothly and successfully, without any conflict among the user groups.

Households are members of primary, secondary or tertiary groups according to their positions. They follow various different measures to ensure a fair and equitable distribution of their shares of the whole product. These vary from employing a secondary rotation system among the respective shareholders, to allowing all co-owners to have access to proportional shares during their respective turns. Any household in a group is also permitted, during his turn, to grant his share to anybody else, to sell the product, or to alienate his shares on a permanent basis to anybody within or outside the user group.

In Odier village the *moshin* management system among the main clans is complex. In the initial stages, the then-existing households within a co-owners group were allotted an annual share of fixed loads, and a management plan was devised that adopted a rotational cycle. The descendants then followed the same general principles of management and equity. Today's inheritors still keep to the old methods, without modification, even with the ongoing disintegration of joint families.

In the following pages, the *moshin* management and distribution practised by the principal clans and families of Odier is presented in detail. The main focus is on clan and family management of a single *moshin* plot. *Moshin* owned and managed by individual households is not discussed here, to avoid confusion. The traditional joint-ownership systems as well as equity issues are discussed in detail for each clan and its respective households, in order to highlight traditional mechanisms adopted for the management and distribution of a limited natural resource at a supra-household level in the village.

## I) Somalay Clan

The Somalay clan has its *moshin* at two different sites. One is located in the main summer pasture of the village at about 3,500 m (case 1 Khotocho gol); the other is located to the west of the village at 3,200 m (case 2 Yor Teli). The two locations are under different management systems. Most of the households (43 out of 55) have their shares in the former location, the summer pasture. Its total annual production is about 16 loads. The distribution is quite complicated, rotating among the primary groups on a yearly basis, with one cycle taking five years to complete. Every year between two and three primary groups have access to the *moshin*, and in addition, two to three households in both the secondary and tertiary groups have access as well.

There are 12 primary groups, 11 secondary and four tertiary groups in the whole system, with a total of 43 shareholders (households).<sup>84</sup> Only three single households are still in the category of primary owners (Fig. 3.11).

### a) Case 1 (*Khotocho gol*)

Year 1:

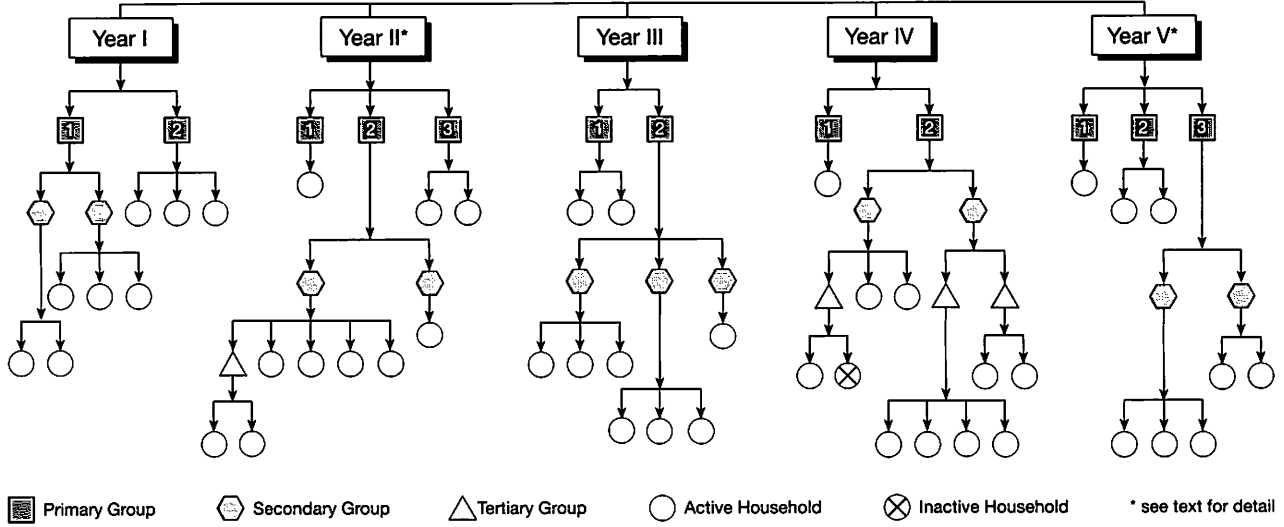
Starting from the first year in the five-year cycle, two primary groups have access to the *moshin* crop. The whole product (16 loads) is first divided between them into two equal parts, i.e., each group is entitled to withdraw eight loads. In this case, the first primary group constitutes two secondary groups, with a membership of two and three households respectively. The secondary groups share half of the product, further dividing their portion into four loads each. In the secondary group comprised of two households, each household gets two loads, but the other group with three households finds this too cost intensive. Therefore they have instituted a secondary rotation system among themselves for their total share of four loads. This means that each household in this group is entitled to four loads every 15 years. The three households belonging to the second primary group share half of the total product (eight loads) and divide it among themselves in equal proportions. Thus, these three households are each getting their share of 2.6 loads once every five years.

Year 2:

Three primary groups have access in the second year of the cycle, and the whole product is first divided into three equal shares (5.33 loads each) among them. The first primary group consists of a single household, which thus has its share of 5.33 loads every five years. The second primary group is comprised of two households who divide their share equally, i.e., each receives 2.6 loads. This second primary group is entitled to another share of the same quantity (2.6 loads) in the fifth year of the rotational cycle. In this way, these households are getting on the average one load per annum. The third

<sup>84</sup> Two households have a double share in the five-year cycle due to unknown reasons. It is possible that their common grandfather was relatively powerful in the village in his time, although it is almost certain that he was not holding a position in the former state administration. About 10 years ago, there were 44 households. Two of these households became inactive because of the death of the family head; one of them merged again with its original joint family; the other widow, along with her whole family, is currently residing with her brother. She may re-establish her own household at some time in the near future.

Fig. 3.11 Somalay Clan: Management of Prangus pabularia (Moshin)





primary group constitutes two secondary groups, one consisting of one household, and the other of four households with an additional tertiary group made up of two households. The former secondary group (with its single household) is entitled to 2.6 loads every five years. In the case of the other secondary group (with four households), each household is allowed to withdraw 0.52 loads. The remaining two households of the tertiary group are eligible to only 0.26 loads in every five-year period. To avoid rent dissipation, the households of this secondary group, together with its tertiary section, are following a rotational system for their total share of 2.6 loads. This rotation takes 25 years to complete among the four households of the secondary group, and 50 years for the two tertiary households. Thus, a member of the tertiary group is eligible for his share of 2.6 loads once every five decades!

#### Year 3:

During the third year of the rotational cycle, two primary groups share the whole product on an equal basis. Primary group 1 consists of only two households, each of which gets four loads. The remaining eight loads are divided among the three secondary groups belonging to primary group 2. One of these secondary groups constitutes a single household that gets its share of 2.6 loads every five years. The remaining two secondary groups are comprised of three households each, and they share their 2.6 loads equally among themselves, i.e., 0.86 loads each. As the individual household shares are less than one load in five years, both these secondary groups of three households are following a secondary rotation system. Thus, each household in these two secondary groups is entitled to 2.6 loads once every 15 years.

#### Year 4:

For this year of the rotational cycle, once again there are two primary groups and the product is equally divided between them, i.e., eight loads each. Primary group 1 constitutes a single household and is thus entitled to eight loads every fifth year. Primary group 2 is divided into two secondary groups. One of them is further subdivided into two tertiary groups, comprised of two and four households respectively. In the former tertiary group, each household receives a share of one load, and in the latter, each gets 0.5 loads per rotational cycle. Since the individual shares of the four households in this latter tertiary group are negligible, they therefore also follow a rotational cycle among themselves, in which each household is entitled to two loads of fodder once every two decades. The other secondary group is comprised of three households, excluding the inactive household in the tertiary group. They also practise a rotation system, with each household getting four loads once every 15 years.

#### Year 5:

For the last year of the rotational cycle, once again there are three primary groups, each of which is entitled to a  $\frac{1}{3}$  share, or 5.33 loads each. Primary group 1 consists of a single household and is thus eligible for 5.33 loads every rotational cycle. Primary group 2, constituting two households, has already been discussed in the second year of their rotational cycle (see year 2). Each of these two households withdraws 2.6 loads. Primary group 3 constitutes two secondary groups of two and three households respectively. They own the remaining share of the year, 5.33 loads. The secondary group

with two households shares its 2.6 loads; thus each household is eligible to withdraw 1.3 loads once every five years. The other secondary group, with three households, is entitled to the rest, i.e. 0.86 loads per household. They also follow a rotational system, in which each household gets 2.6 loads once every 15 years.

#### b) Case 2 (*Yor Teli*)

The second *moshin* area owned by the Somalay clan is located to the west of the village and is owned by seven households of the clan. This land is relatively close by, and the *moshin* plants are distributed over an area with gentle slope. Two primary groups share the rights to this *moshin*. The total production is eight loads per annum, which are equally divided between the two primary groups. One of the primary groups consists of a single household, which collects its share of four loads every year. The other primary group consists of three secondary groups of one, two and three households respectively. They have formulated a multilevel yearly rotation system of their own. The first rotational-turn level is among the three secondary groups: this level of the cycle takes three years to complete, with the entire share of four loads going to a different secondary group each year. The second level is among the individual households within each group. Each year one household of the secondary group whose turn it is receives, again, the entire share of four loads. Hence, for the three secondary groups, it takes respectively three, six and nine years to complete one cycle of rotation among them.

The remaining five households of this clan have their *moshin* in the same location (*Yor Teli*), with a total production of eight loads per annum. In this case there are two primary groups. One primary group comprises two households; the other primary group is further subdivided into two secondary groups, consisting of one and two households respectively. The access of the two primary groups to their equal shares of four loads each is similar to the other cases, but the distribution within the groups is different. Instead of sharing the product every year, the households follow another secondary rotation system. In the case of the two-household primary group, each household has access to the total share of four loads once every two years.

The other two secondary groups, made up of three households altogether, also follow a similar method, whereby the single-household secondary group is entitled to the total group shares (four loads) once every second year, and each of the two households in the other two groups, once every fourth year.

## II) Shaipay Clan

This clan has its *moshin* in the Khotochogol area at an elevation of about 3,400 m. Almost every household of this clan has its share in more than one *moshin* management group (Tab. 3.3). The management system varies from group to group, and only two households have their own *moshin* and do not practice a family-level rotation system. However, they are also included in a group at the neighbourhood management level. Only two cases are presented here in detail.

**Tab. 3.3 Shaipay Clan: Moshin Management**

| Nº    | Households    | Amount   | Management system                          |
|-------|---------------|----------|--|
| 1     | 14 (3 groups) | 12 loads | Complicated turn system (cf. case 1)       |
| 2     | 2             | 13 loads | Yearly turn system                         |
| 3     | 1             | 08 loads | Individual ownership                       |
| 4     | 1             | 08 loads | Individual ownership                       |
| 5     | 3             | 03 loads | Yearly turn system                         |
| 6     | 4             | 03 loads | Yearly turn system                         |
| 7     | 4             | 03 loads | Yearly turn system                         |
| 8     | 4             | 06 loads | Turn system: 2 households in altern. years |
| 9     | 6             | 12 loads | Complicated turn system (cf. case 2)       |
| Total | 39 (see text) | 68 loads | 4.25 loads per household per annum         |

Source Author's own survey

**a) Case 1:**

In this management system, the *moshin* has been divided into two sections or parts that rotate among 14 households in three neighbourhoods – Jinali (four households), Deronas (four households) and Damphav (six households). The total production is approximately twelve loads per annum. The two *moshin* parts are named after their relative locations, i.e., upper and lower. As the terrain of these *moshin* areas is not similar, and their productivity also varies, the Shaipay households have put both sections into clan-level rotation. There are four primary groups comprising three neighbourhoods: Deronas and Samphav have a single membership each, and Jinali has two. In the first year one of the neighbourhoods, e.g., Jinali-I, has its turn in the upper part and simultaneously another neighbourhood, Damphav, has its turn in the lower part. The following year, the upper part goes to the latter (Damphav) and the lower part to Jinali-II.<sup>85</sup>

In the third year, the Deronas neighbourhood harvests the upper part and Damphav harvests the lower part. Thus in the first level of the management system, the two parts of this *moshin* rotate alternately among the neighbourhoods. In the second level, the actual distribution, the rotation system takes place among the households within the individual neighbourhoods. All of them follow a rotational system and collect their shares in their respective turns.

In addition to and simultaneous with this two-tiered clan-based distribution method, the above-mentioned three neighbourhoods of the Shaipay clan also have another *moshin* rotation system at their own individual family level. One example is presented below.

<sup>85</sup> Eight individuals from this secondary group (Jinali-II), presently comprising two households, had left the village in the past and settled elsewhere in the former state.

**b) Case 2:**

This case is based on differential shares of the households within a family rotation system. The six Shaipay clan households of the Damphav neighbourhood have their own *moshin* located in the summer pasture, with a total production of about twelve loads per annum. They have divided that *moshin* into two equal parts of six loads each, and placed it under an independent annual rotation system. One rotation is completed every two years; the entitlement of the households to the produce varies in each rotation.

In the first year, for example, three households, i.e., A,<sup>86</sup> B and C, have their turn. The whole product is divided in such a way that the two households A and B share one half of the produce (six loads), three loads each, and household C alone is entitled to the rest, or six loads. Since household C currently has another subsidiary member (C1) – one brother has founded a nuclear family – it shares the amount with him accordingly, either dividing the six loads equally with him during its turn or giving alternate whole turns to C1.

In the second year households B, D and E have their turn. Households E and B share one half (six loads) and household D receives the remaining *moshin*. In this distribution system, household B is sharing ½ of the product every year, once with household A in the first year, and then with household E in the second year. This means that household B is entitled to three loads per annum. Household C and D are entitled to half of the total product (six loads) on alternate years. The case of households A and E is different, as they both are sharing half of the product (six loads) every third year. Thus household B is in a relatively better position than the others, as its total share is equal to that of household D and C in quantity, but there is no break in its entitlement.

**Tab. 3.4 Bulay Clan: Moshin Management**

| Nº    | Households       | Amount    | Management system                              |
|-------|------------------|-----------|--|
| 1     | 3 (Six brothers) | 28 loads  | 1 household 12, one three + remaining 13 loads |
| 2     | 5                | 04 loads  | Complicated turn system (cf. case 1&2)         |
| 3     | 4                | 04 loads  | Yearly turn: 2 households in alternating years |
| 4     | 2                | 03 loads  | Yearly turn: 1 household every year            |
| 5     | 6                | 04 loads  | Yearly turn: 1 household every year            |
| 6     | 1                | 03 loads  | Individual ownership                           |
| 7     | 3                | 04 loads  | Complicated turn system (cf. case 1&2)         |
| 8     | 4                | 06 loads  | Yearly turn                                    |
| 9     | 5                | 46 loads  | Complicated turn system (cf. case 3)           |
| Total | 33 (see text)    | 102 loads | 3.29 loads per household per annum             |

Source: Author's own survey

<sup>86</sup> Two brothers of this household have already settled elsewhere, but have not yet sold their shares in the village land resources to anybody else.

In addition to the two cases presented here, one household member from the Shaipay clan has teamed up with his brother-in-law. Together they have jointly purchased arable land in the lower part of the village from an absentee landlord. Thus, for the last ten years the above-mentioned Shaipay household has been a member of another *moshin* management group within the Bulay clan. The yearly share of the two brothers varies between eight and 15 loads (see below).

### III) Bulay Clan

There are a total of nine groups in the Bulay clan, consisting of 33 households. All the households of this clan have *moshin* in the main alpine pasture of the village. There is a general variation in *moshin* ownership among and between the groups (Tab. 3.4). In three cases there are differential withdrawal rights, and the participants in these cases follow a different system of management. These three cases are discussed below in detail.

#### a) Cases 1&2:

In case 1, five households share a total production of four loads per annum. The management system follows a yearly rotation with differentiated shares. The first year households A and E share the total production, and the next year household B shares the produce with household E.<sup>87</sup> In the third year households C and D equally divide the produce between themselves. The same method is used in case 2, where three households share four loads. They also follow a yearly turn system, in which one household has a double share compared to the other two, since it has two turns in every four years, whereas the others have only one each.

#### b) Case 3:

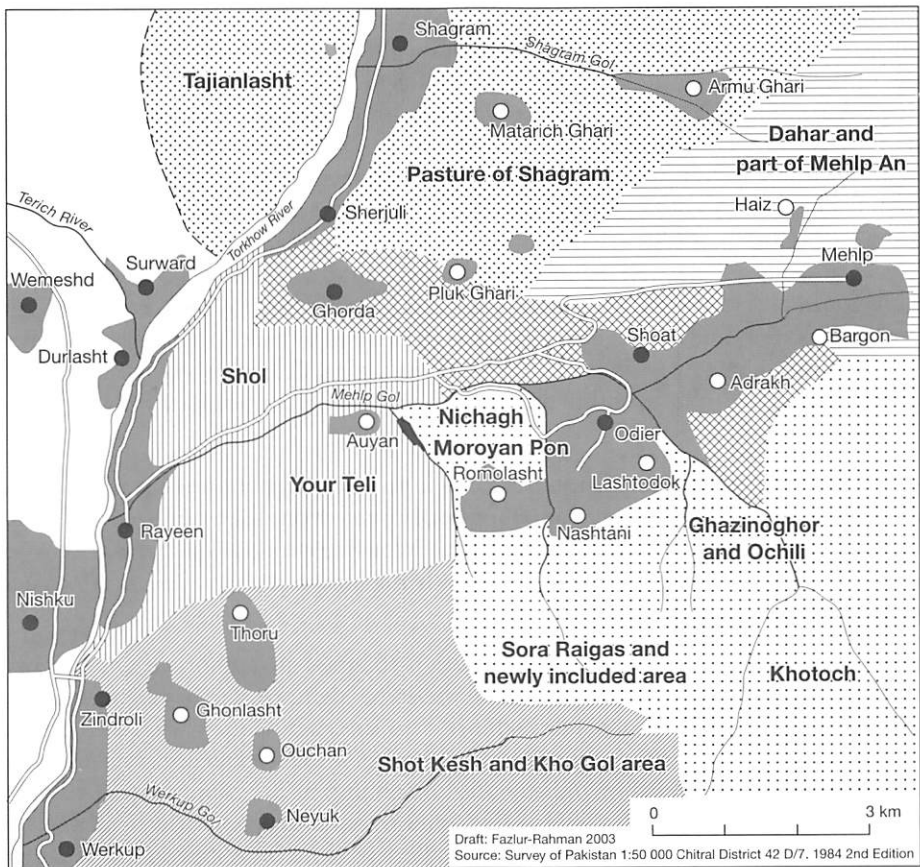
In this case there are two groups consisting of three and two households respectively. (The latter became members of this group after purchasing arable land with *moshin*.) The two groups together have two *moshin* areas with varying productivity: one plot yields 16 loads per annum, and the other 30. They follow a bi-level management system: one between the groups, and the other among the households in each group. In the first year, one group is entitled to the *moshin* plot that yields 16 loads, and the other to the 30 loads, and the following year, vice versa. Every year the households divide their whole produce on an equal basis.

### IV) Nasketek Clan

In contrast to the other clans in the village, only six households of this clan have *moshin*. Their crop is located on the other side of Mehlp stream in the pasture area of the Shoat villagers (Lashto Sor). Two of these households have personal *moshin* (purchased with arable land), consisting of seven and twelve loads respectively. These two households also share a part of their *moshin* with their two brothers (making four households in all). The respective owners in this example follow a yearly rotation system. In the case of the remaining two households, the *moshin* area is divided into two sections which the co-owners harvest every year in alternation.

<sup>87</sup> Two brothers of this household have migrated from the village and settled elsewhere.

Given the complicated *moshin* entitlement and distribution systems used in the village, it might seem very difficult for a member of a *moshin* management group to remember both his personal turn and share, as well as the over-all rotation system. The *moshin* harvest takes place once a year and some of these households have their turn only once every five decades. One could easily think that this would inevitably lead to confusion and conflicts. But this hypothesis is nullified by the distribution of the clans in the village. The clans live in separate sections, and most clan members attend the same neighbourhood mosques in both their respective winter quarters and in the summer season. This provides them with an on-going opportunity to discuss all matters thoroughly – to make clear who is entitled to which portion in the current year, and what the situation will be in the upcoming year. There have been no conflicts or disputes over the entitlement and sharing of this resource in the living memory of the



Map 3.5 Pasture Ownership in Mehlp Valley and Surrounding Villages

inhabitants. Although there is no equity in the current distribution system, this form of management has persisted for a very long time and the shareholders have accepted it. Although the resource base is very limited, with variable productivity, the management mechanisms are very well adapted. The system has evolved with the passage of time, and the rules thus formulated have become an integral part of the whole traditional knowledge system.

#### **3.4.4 User Groups as Resource Owners**

With the increasing population and general expansion of the number of households in the whole village, the villagers have faced two interrelated problems regarding the management of their common-property pasture resources. On the one hand, it became difficult for some households to collect their shares from the village commons, and on the other hand, because the population of co-owner households also increased, the production of the small pastures was no longer enough for all the shareholders. The villagers resolved these problems by forming user groups and allocating the pastures to them, keeping in mind the pastures' area, productivity and proximity to winter dwellings. Accordingly, households residing in a neighbourhood close to a pasture became de-facto co-owners of particular named pastures. In this way, resource user groups were established. These groups are made up of households living in the village and belonging to different clans. According to the old distribution and usage pattern, members of such groups own their respective shares in the common property resources. The groups are decentralised and have well-defined memberships. Independent user groups have de-facto control over their respective resources, and full authority for the formulation and promulgation of rules and regulations. These days the rules have become the customary laws and common conventions that define access rights, determine ways and methods of utilisation, and also establish the owners' relevant responsibilities with regard to management.

Irrigation water, although it is also treated as a common property resource, is handled differently. In contrast to other common property resources, shares in irrigation water are fixed and can be traded in the market. Except for system operation and maintenance responsibilities, the conditions relevant for other common property resources (such as pastures) are not applicable in this case.

User groups with rights to individual irrigation channels are authorised to grant new shares or access rights and also to redefine the access rights of the members. They can also suspend the existing rights of a member. This latter action may be taken as a form of punishment for somebody who has either broken a rule or failed to contribute his fair share to the maintenance and smooth functioning of the common property system. Usually once the access rights to this resource have been consensually defined by the community of co-owners, they remain effective for a longer period of time, up to many generations. Nevertheless, members or co-owners of all common-property resource management groups who share common pool resources are obligated to meet certain prerequisites and to fulfil other associated responsibilities in order to uphold their claims.

### 3.4.4.1 Pastures and Pasture Resources

Pastures and pasture resources are well integrated into the domestic production systems. The designation of differential ownership regimes to such resources is another strategy designed to fulfil the households' fodder and firewood requirements and compensate for deficiencies. These resources are shared among the co-owners. Strict equity is maintained for some resources; but for others, no such measures are adopted. There are five named pastures owned by the user groups of the village (cf. Map 3.5). Three of them are exclusively reserved for firewood, and two for fodder collection (Tab. 3.5).

#### I) Nichagh Pasture

The name *Nichagh* literally means an area having northern exposure. This area is located very close to the lower part of the village. It is a common property shared by 42 households of the village. The majority of the owners are Somalay (28 households); Bulay, Shadeyay and Shaipay clans have four households each; and two households of the Nasketek clan are also included in this user group. Most of the owners have arable land and houses in the lower part of the village. For the last hundred years or so, the co-owners have declared this pasture a permanent reserve area (*saq*)<sup>88</sup> for the extraction of firewood. They have appointed two watchers (*darophal*) to control free riders and unauthorised users. As the pasture is located very close to the winter dwellings, there is no problem of free riders; however, an organisation is always needed to oversee proper management.

Different species of artemisia and wild rose are grown here. The owners have the right to extract fuel wood and graze their sheep and goats in this area. Some non-owner households who have winter houses in the lower part of the village also have some secondary access rights and are allowed to graze their sheep and goats here. This area has been divided into different named sections for the extraction of fuel wood, and every year one section is declared open upon consultation with the watchmen (*darophal*) and the elders of the user group. The system follows the general principles of reserve in open,

<sup>88</sup> *Saq* is a pasture area that is purposely reserved for single or multiple resources (fodder, firewood or both), agreed upon either by the concerned households or by all the households of a village, through the creation of a joint user group with a definite membership. FAIZI (1999: 9) has identified three different types of *saq* in practice, according to the access, implements used and duration of *saq* period. In all circumstances, the boundaries of *saq* areas are properly demarcated, and the responsibility for guarding against free riders and non-owners is entrusted to persons locally called *darophal*. The whole community or the concerned user groups appoint these watchmen through mutual consensus for an unlimited time period. Within the *saq* territorial limits nobody (not even members of the *saq* community) is allowed to extract the particular resources for which it has been reserved without prior permission from the community/watchmen. The community can declassify the *saq* area at any time, based on democratic process; they can relax the ban or reclassify any area used by the community as open access, as reserved, or *saq*. Similar conservation and management practices have been recently introduced in the treeless area of upper Ghizer district. For more details see BAIG (1994: 121f.). A similar system of communal management and conservation has been reported from Shishi valley, in southern Chitral. According to HASERODT (1989a: 126) "Dazu gehören die zeitweilige Schonung von dorfnahe Eichenbeständen für eine stärkere Winternutzung oder das zeitweilige Herausnehmen von Geländeteilen über eine Reihe von Jahren aus jeglicher Nutzung (*hujjat*) zum Zwecke der Regeneration."



i.e., there is a fixed designation of days, duration and number of loads per household. This ban is relaxed only in the spring season, shortly after the snowmelt. The spring thaw facilitates the extraction process, as the different species of artemisia can be easily up-rooted from the soft, wet soil. An owner can give his share to any member of the user group or any outsider, as he wishes. Members of this user group are also allowed to exchange their shares, on a permanent or temporary basis, with anybody else in other user groups, according to their convenience.

On the opening day (*saq bicherik*) in spring, all the co-owners assemble at a predetermined place on the way to or within the *saq* area. The watchmen show them the boundaries of the specific area, which is then declared open. After discussing relevant matters for about half an hour, the firewood collection starts. Each person is confined to a single location, so everybody tries to find an area richer in terms of plant density. The overall morphology of the pasture sections varies, with small and large watershed-like structures and steep slopes. Therefore, there is a high probability of rock and pebble fall when anybody moves and collects firewood in the up-slope positions, and the persons working at lower levels are vulnerable to injury. To increase safety, all the villagers follow a simple rule during the collection of firewood and fodder: nobody collects above another in his limited area.

No fodder collection is allowed in the Nichagh pasture. Rather, it is reserved for spring-season grazing only. Because of its proximity to the dwellings, even the weak sheep and goats can be driven there for daily grazing. This time of year also coincides with the seasonal fodder scarcity in the village, as most of the households have depleted their fodder stocks. Therefore, all the households with winter houses in this part of the village occupy their house in the late winter or early spring season to avail themselves of this grazing opportunity. Together with other factors, this is one reason for winter season movement in the village (cf. Chap. 4.5.2).

## II) Moroyan Pon Pasture

The Moroyan Pon pasture is *saq* area belonging to another group of households in the village. It is located towards the western side of the summer settlement of Romolasht. It has a common boundary on one side with the Nichagh pasture, and on the other side with the pasture and birch groves of Rayeen villagers. The boundaries on both sides are well defined, without any confusion. It is relatively small in area and has a southern exposure. In general this pasture is used by most households of the village for grazing sheep and goats during spring and winter. Previously, yak owners also used it as a winter pasture. No fodder is collected from this area. This user group consists of 29 households. Except for two households (one each from the Shaipay and Shadeyay clans), all the co-owners belong to the Somalay clan. The group extracts fuel wood according to self-formulated regulations. The group also keeps two watchmen (*darophal*) for proper control and management purposes.

**Tab. 3.5 Pasture Utilisation in Odier**

| Pastures/<br>(Altitude in<br>Meter) | De facto<br>owners/<br>users               | Primary<br>owner<br>(Hh) | Secondary<br>users (Hh) | Resources   | Extraction<br>system | Watchmen<br>(Darophal) |
|-------------------------------------|--|--------------------------|-------------------------|---|----------------------|------------------------|
| Nichagh<br>(2700–3200)              | Odier (de-<br>fined user<br>group)         | 42                       | -                       | Firewood<br>collection,<br>sheep and<br>goats gra-<br>zing                                      | Reserved             | Yes                    |
| -do-                                | Other<br>households<br>of Odier<br>village | -                        | 25                      | Only sheep<br>and goats<br>grazing  | Allowed              | No                     |
| Moryan Pon<br>(3000–3200)           | Odier (de-<br>fined user<br>group)         | 29                       | -                       | Firewood<br>collection<br>sheep and<br>goats gra-<br>zing                                       | Reserved             | Yes                    |
| -do-                                | Other<br>households<br>of Odier<br>village | -                        | 65                      | Only sheep<br>and goats<br>grazing  | Allowed              | No                     |
| Ghazinoghor<br>(2900–3300)          | Odier (de-<br>fined user<br>group)         | 49                       | -                       | Firewood,<br>fodder coll-<br>ection and<br>sheep and<br>goats gra-<br>zing                      | Reserved             | Yes                    |
| -do-                                | Other<br>households<br>of Odier<br>village | -                        | 30                      | Only sheep<br>and goats<br>grazing  | Allowed              | No                     |
| Ochili<br>Pasture<br>(3100–3300)    | Odier (de-<br>fined user<br>group)         | 50                       | -                       | Fodder<br>collection<br>only and<br>livestock<br>grazing for<br>all house-<br>holds of<br>Odier | Reserved             | Yes                    |
| Sora Rai Gas<br>(3200–3500)         | -do-                                       | 70                       | -                       | -do-  | Reserved             | Yes                    |

No: not relevant      Hh: households  
Source      Author's own survey, 2001

Each year before opening the pasture, the total permitted number of loads and days for collecting the fuel wood is announced, and every member of the user group is properly informed. This is usually carried out in the spring season. All the other rules and regulations, as well as the exchange system, are the same as those mentioned above. All the fuel wood is stocked in the winter houses as usual. On the eastern side of this pasture, there is some encroachment by a few land-poor households who do not belong to this group. Up until recently the resource owners were still harvesting fuel wood from their regular fields during the opening periods. But now they are becoming more 'polite' and the encroaching field owners are stronger than ever. However, this practice is not very good for the management of the common property resources in the long run. It

is a clear indicator of losing interest in the property, which is not a healthy sign for the sustainability of resources and their management mechanisms.

### III) Ghazinoghor Pasture

This pasture is located on the northeastern side of the upper part of the village, close to the dwellings. It was an area rich in both firewood and fodder, and until 1989, it was reserved as a *sag* area for both purposes. A total of 49 member/co-owner households were entitled to collect fuel wood only (the case of fodder is discussed below). The majority of these households were from the Bulay clan (27), followed by Shaipay (11) and Nasketek (8). All (3) households of the Khushay clan were also included in this group. Out of the whole group, only 27 households used the area as winter and early spring pasture for grazing goats and sheep. After the amelioration of the surrounding areas, the nearby households were entirely dependent on it as their sole winter pasture for goat grazing. The whole area was suitable for development by constructing irrigation channels, in which case there would be no longer be any shortage of water. In one section of the pasture there was even no need to construct a channel, because one of the seasonal streams was flowing through it. In the late 1970s one of the co-owners from Nasketek clan approached the state and got permission to reclaim some area in the easternmost part of the pasture. Later on, another co-owner from the Shaipay clan also got ownership rights there for reclamation. This situation made it difficult for the other *sag* members to maintain the pasture for grazing. Eventually, with the financial and technical assistance of AKRSP, the area was ameliorated and brought under individual ownership (cf. Chap. 5.6.1).

### IV) Ochili Pasture

Ochili pasture is located towards the eastern side of the Ghazinoghor pasture. It was considered to be part of Ghazinoghor pasture for the collection of fuel wood and belongs to the same user group. It was also reserved for haymaking. Due to its exposure and steep slope, the growth of natural grass and fodder plants were sufficient for seasonal haymaking. Along with other pastures of the village, it was protected as a *sag* from the last week of May until the first week of August; grazing of sheep and goats was not allowed here. The date for collective haymaking in the commons was formally announced around the first week of August, after the Friday congregation in the central mosque of the village. Then the user groups were allowed to cut fodder from all the reserved communal pastures.

The system of haymaking is different from firewood collection, although in both cases the pastures are reserved (*sag*) and nobody is allowed to enter the area before the formal opening. In the case of fodder collection, there is no restriction on the number of loads or the time duration, and no care is taken for equity. Similar to the old practices in the Khumbu region of Nepal (cf. STEVENS 1993: 166), after opening the pastures for haymaking, a general scene of competition among the households ensues and a first-come first-serve rule usually applies. All the able-bodied men from a household, including children over 10 years old, engage in this work (cf. HASERODT 1989a: 126). During the haymaking season, most of the households remain in the pasture from early dawn till evening, collecting as much fodder as possible. Households with more

male labour force at their disposal are generally in a better position, even though this season coincides with another peak of agricultural work in the village, i.e., harvesting (cf. Chap. 4.2.2).

There are other rules for fodder collection. For one, there is the possibility of reserving a particular area after the formal opening of the pastures. A household member collects a quantity of fodder and leaves it at his location as a marker of his occupancy. All other co-owners always respect this marker, and everybody tries to occupy and reserve the best sites. Although this is against the general principle of equity, this practice is accepted and followed by most of the households. There is no possibility of applying this rule during firewood collection, since nobody is allowed to harvest more than one load per day. The case of fodder, however, is entirely different because of its weight and the general practice of keeping the harvested product in the pasture area and waiting for it to dry. Usually a person's daily harvest is more than he can transport down to the village. Therefore, he leaves most of his harvest there on the pasture for drying. Later on, he makes several round trips to transport the dried fodder down to the winter houses. For safety reasons, the tradition of up-slope reservation is also practised in collecting fodder. When a person starts at the foot of a local slope, he is entitled to harvest that slope up to the watershed, and nobody is allowed to harvest the area above him.

After the development of Ghazinoghor pasture, the village community declared the Ochili section of the pasture an open access (*rai*) for the affected households of the former user group. This step was taken to compensate them for the loss of their nearby pasture, and to facilitate their seasonal sheep grazing. Unfortunately, this measure was not enough for the affected households due to several factors: the Ochili pasture is relatively far away from the dwellings, and due to its steep slope, there is a potential risk of avalanches in winter and rock fall in spring.

In the past the poor households were able to collect considerable amounts of fodder and firewood from this reserved area. Since the area has been converted into private property, the fuel wood production has increased for individual owners, but the poor households are now restricted to their own small plots for haymaking, and the seasonal grazing of sheep and goats here has totally stopped.

#### V) Sora Rai Gas and the Newly Reserved Area

The Sora Rai Gas area is located in the upper part of the village above the area owned by clans, at an altitude of between 3,300 to more than 4,000 m a.s.l. A part of this area is bounded by the summer settlements of Nashtani and Lashto Dok. This pasture was and still is used for grazing sheep in the summer and goats during the late autumn and early spring seasons. The area was and is reserved for fodder and firewood collection. Some parts of the area, mostly the uppermost watersheds, were kept as an open access for year-round fuel wood collection.

The newly reserved area, located above the arable land in the Romolasht summer settlement, is handled differently. In the past, it was used for seasonal grazing and was treated as an open access for firewood collection. With the passage of time the nearby areas owned by the respective clans were developed and brought under individual

ownership, thus creating stress for sheep grazing and intensifying the use of this open-access pasture. As the land was very close to the dwellings, even children could easily collect fuel wood from there to fulfil summer season firewood needs. Thus this area became heavily stressed and over-utilised. The villagers generally feared that the natural re-growth cycle of the plants, especially *Echinops sp. (istorjochun)*, was slower than the extraction rate. Therefore, to avoid further deterioration of the habitat, a permanent ban on the collection of fodder and fuel wood has now been imposed on this area. For the last three years, this pasture has been added to the village reserve pool (*saq*) through an unanimous decision of the whole community. The boundaries of the area have been demarcated anew for the purpose of conservation, and the utilisation procedure is not yet finalised. The whole uncultivated area around the village has been declared reserved and, except for some areas owned by the main clans, the sheep grazing area (*mal rochi-ni*) has been drastically decreased. On the other hand, the local people have become more conscious of their resources and have recognised the degradation process of plant communities in the pasture area. This area definitely needs some time for regeneration. When that has occurred, and when the old system of co-ownership and equity is properly maintained, this will further help the community by enhancing their firewood and fodder resources.

Mutual interaction is very important to the management system and decision-making process of the different user groups of the individual pastures – and the villagers kept this factor in mind at the time of forming their groups. As a result, with only a few exceptions the majority of a resource user group consists of households belonging to one clan and residing in one section of the village, in small neighbourhoods. Most of the user group members also attend the same neighbourhood mosques during the winter season, which lasts for more than five months. Therefore, decisions regarding the coming season – general land use, opening times, the appointment and removal of watchmen, and the quantity of resources to be extracted from the pasture – are all agreed upon through consensus by the majority of the co-owners who live together in the neighbourhoods. The other co-owners who reside outside of this main agglomeration are then informed of these decisions. In case they have any reservations, objections or recommendations other than those already agreed upon, a general meeting of all the owners is convened and a new agreement is then reached through mutual consensus and approved for further implementation.

#### **3.4.4.2 Irrigation Water: Allocation and Related Responsibilities**

Compared to other common-property resource management systems at the village level, the management of irrigation water in the arid mountain regions has some distinctive characteristics. In general, there is a relatively long history of successful co-operative water management (cf. GIBBS & BROMLEY 1989; OSTROM 1990; BROMLEY 1992: 11f.; WADE 1992 and IFAD 1995). The whole system of water management – from the construction of irrigation infrastructures, to water allocation, repair and maintenance of the system and seasonal operation – is all performed by the co-owner communities. Because of the importance of irrigation as a main input in mixed mountain agriculture and how heavily the inhabitants depend on it for existence, most of the long-term decentralised local institutions are found in small-scale water management systems. As a

common property system, water management has the longest history of successful and resilient resource-management systems, with its comprehensive and sometimes complicated distribution of responsibilities among the concerned co-owners in the mountain areas of northern Pakistan and elsewhere.<sup>89</sup> Moreover, due to its success, water management has also provided a basic framework for social organisations and autochthonous institutions for collective action at the village level.<sup>90</sup>

In the extremely arid milieu of the study area, arable farming is impossible without artificial irrigation. The main water sources are small irrigation channels, mostly extended out from the seasonal streams, which are exclusively fed by snowmelt. Therefore, both the timing and actual amount of winter snowfall are crucial factors for water availability in the village. Early snowfall in December and January is highly appreciated by the villagers as the optimal potential water source for the forthcoming cropping season (WHITEMANN 1988: 65). Simultaneously a strong wind following a snowfall event is also essential for transporting the snow and ensuring that it accumulates in sheltered areas and gorges. The wind also triggers avalanches, thus causing huge amounts of snow to be deposited in deep valleys, in the form of thick masses. This process of redistribution is very important, because of the relatively rapid ablation of the normal snowfield when the temperature increases in spring (cf. HEWITT 1989: 15).

With few exceptions, the main rivers in the region have very limited utility for irrigation purposes due to topographical constraints (cf. HASERODT 1989a; ISRAR-UD-DIN 1996, 2000 and BAIG 1997). It is rather the tributary streams and seasonal torrents that provide the main source of irrigation, and in general the availability of water for irrigation varies from village to village.

At village level, irrigation water is treated as a common property resource with some special rules. All relevant irrigation structures are collectively constructed and maintained by the respective shareholders. The shares of the individual members are fixed at the time of construction, or redefined later following a major overhaul or realignment of the channel. The owners maintain their respective shares by fulfilling their associated responsibilities and duties. The intentional absence of any shareholder from the annual repair work invalidates his access right temporarily, and if a member is absent from any major repair or realignment work, he may lose his share forever. Nevertheless, there are some welfare packages within the system for needy and helpless households.

<sup>89</sup> For further details on this topic see ROBERTSON (1896: 436ff.); NETTING (1974); HUNT & HUNT (1976); COWARD (1979, 1990); ALLAN (1986a); KREUTZMANN (1988, 1989, 1998b, 2000c); VELDE (1990, 1992); SHAH (1991); ISRAR-UD-DIN (1992a; 1996, 2000); ADAMS, PATKANSKI & SUTTON (1994); KHAN et al. (1994); BAKER (1997); BAIG (1997); GUTSCHOW (1997, 1998) and SCHMIDT (2001.)

<sup>90</sup> The efficiency of irrigation infrastructure management in the mountainous region of Northern Pakistan is a result of the decentralised village level organisations. Whereas, large-scale irrigation projects in the plain areas of the developing countries are usually facing a variety of institutional problems. For details see, RENGER & WOLFF (2000).

Compared to other common property systems, irrigation-water is usually associated with the transaction of arable land. However, any individual can also buy or sell his water share with land or without it (cf. Chap. 3.2.4).

The main irrigation structures in the village are small channels designed exclusively for gravity flow of water taken out from the nearby streams. There are 13 main channels of various dimensions for irrigating the arable land of this village (Tab. 3.6). At the time these structures were initially constructed in the past, the water rights were also determined. With the passage of time, however, many of the channels were realigned and extended. Moreover, land transaction and changes in tenure also resulted in the redistribution of water shares among the households and clans. In general, all households sharing one irrigation channel are considered as a single group, and usually each user or household has a membership in up to four separate systems. There is no formal elected or selected committee responsible for organising the system; rather the users of each channel constitute its organising committee, and they are practically following the decisions and regulatory arrangements formulated by their ancestors in the past. All shareholders are members and have the authority to formulate new rules or to change the existing ones according to the situation. They may also impose fines and penalties on any defaulters. They have the authority to grant new water turns to any household and also to upgrade the status or increase the duration of an existing turn. Such individual cases are always decided at the time of annual repair by the members of a user group through a process of general consensus. The person requesting an up-grade of an existing lower-level water turn or the granting of a new water turn has to do a lot of lobbying to get through the process successfully. Once such a matter is decided through consensus, however, it automatically becomes a working rule for the future and there is very little possibility of retracting it, as long as the member performs his associated duties and meets his responsibilities.

To ensure efficient and economic utilisation of the irrigation water, all the main channels are under a rotation system. The general rotation cycle varies from a minimum of nine to a maximum fixed upper limit of 18 days. For those channels with more than 18 water turns, the shareholders have further minimised the rotation cycle by combining two shareholders together to constitute subgroups. These secondary groups are constituted on a yearly basis. The primary entitlement to irrigation water in a channel system consists of having a water share (*sorogh*) there. A *sorogh* is a fixed volume of water with a time limit ranging from 24 hours or more to less than one hour (cf. BAIG 1997: 158). As in other areas (KHAN et al. 1994), due to successive inheritance as well as sale and purchase of arable land with irrigation water-shares, there are many households whose share in a water turn varies from half an hour to a few hours.

To regulate and allocate water turns for a single season, decisions are jointly made on the last day of channel repair concerning who will get the first water turn, second, third and so on. The rotation system formulated on this occasion is strictly followed for the whole season, without any further changes or modifications. A water turn in this case lasts for 24 hours, from the dawn of one day until the dawn of the following day. During his turn, the shareholder diverts water into the channel after making necessary and minor repairs (if any) at the headworks; he is also responsible to re-divert the water

there after the completion of his turn. Households sharing a turn decide at their own convenience who will take water in the morning, afternoon and evening. Sometimes they also use water at nighttime, a usage that is locally called *chyogh*. This depends on the nature of the land to be irrigated and the general condition of the channels, including the pattern of discharge at the headworks.

During their turn period, the shareholders are responsible for the safety of the channel. In case of any damage to the channel due to their negligence, they will take the whole responsibility for repairing the channel and compensating any affected persons or households. Any accidental break of the channels or damage to the headworks not only jeopardises the water turn of an irrigator, but also disturbs the whole working plan. To avoid this situation, vigilant supervision over the vulnerable sections of the channel is kept, and special care is taken in considering the possibility of applying *chyogh*.

The overall principle of water utilisation is similar in all the main irrigation channels, with only minor differences from channel to channel. The associated responsibilities among the co-owners of the system are also more or less similar. The differences are usually related to the physical structure of a channel. In the case of long channels, not only are the maintenance responsibilities different, but seasonal watchmen are also appointed for daily care.<sup>91</sup> Four case studies from Odier village are presented here to demonstrate the highlights of water allocation, distribution of operational and maintenance responsibilities, and the crisis management system. In contrast to other areas where irrigation-water-related conflicts are reported to be common (cf. KHAN et al. 1994: 8; BAIG 1997: 159 and KREUTZMANN 2000b: 106), the water management system in this village has been running smoothly for generations. There have been no conflicts among the co-owners in living memory.

### 1) Lower Part of the Village

Four irrigation channels irrigate the lower part of the village. One of these is a channel that exclusively irrigates the upper part of the village, which has been extended to this section.<sup>92</sup> Springs and a single natural pond also contribute some water to the irrigation here. Most of the households have water shares in more than one channel irrigating their respective sections. In this part of the village there is no shortage of water throughout the season.

### Golo Zhoi

This is the only channel that takes water out of the perennial stream, and it irrigates the lower and northern parts of the village. There is no seasonal or diurnal shortage of water at the headworks. The total length of the channel is about four km. It consists of two parts: the old or main channel, which is about 2.5 km long; and a subsidiary section of about 1.5 km, which was added to it by the shareholders about 30 years ago. There is a problem at the headworks of this channel, where an approximately one-km area of the channel is prone to landslides; this section needs realignment almost every year. The

<sup>91</sup> This relationship between channel length and the appointment of *mer zhoi* has been reported from Hunza, as well (cf. VELDE 1990)

<sup>92</sup> Aside from the regular users, most of the absentee landlords and late immigrants have their water shares in this channel (*gramo zhoi*) (cf. Tab. 3.6).



**Tab. 3.6 Odier: Clan-Based Water Turns (sorogh) in the Irrigation Channels**

| Name of the channel (zhoi) | Total water turns sorogh | Duration of cycle (days) | Water turns (sorogh) by clans |          |           |                  |                |                 |                    |
|----------------------------|--------------------------|--------------------------|-------------------------------|----------|-----------|------------------|----------------|-----------------|--------------------|
|                            |                          |                          | Bulay                         | Khushay  | Nasketek  | Shadeyay         | Shaipay        | Somalay         | Absentee Landlords |
| Golo zhoi                  | 13                       | 13                       | 4.5 <sup>a</sup>              | -        | 5         | 0.5 <sup>a</sup> | 3              | -               | -                  |
| Uzumo zhoi                 | 20                       | 10                       | 12 <sup>a</sup>               | -        | 3         | -                | 4              | -               | 1                  |
| Nashtanio zhoi             | 9                        | 9                        | -                             | -        | -         | -                | -              | 9               | -                  |
| Sorung zhoi                | 24                       | 12                       | -                             | -        | -         | -                | 5              | 19 <sup>c</sup> | -                  |
| Barikio zhoi               | 9                        | 9                        | 1 <sup>b</sup>                | -        | -         | -                | 1 <sup>b</sup> | 5               | 2                  |
| Gramo zhoi                 | 28                       | 14                       | -                             | -        | -         | 1                | -              | 19              | 8                  |
| Warano zhoi                | 11                       | 11                       | -                             | -        | -         | -                | 1 <sup>a</sup> | 10              | -                  |
| Tor-lashto zhoi            | 18                       | 18                       | 2                             | -        | -         | -                | 2              | 14              | -                  |
| Mul-lashto zhoi            | 13                       | 13                       | 10                            | -        | 1         | -                | 2              | -               | -                  |
| Naskartalio zhoi           | Free                     | -                        | -                             | -        | -         | -                | -              | -               | -                  |
| Lolumo zhoi                | Free                     | -                        | -                             | -        | -         | -                | -              | -               | -                  |
| Sannan zhoi                | 10                       | 10                       | 4                             | 2        | 2         | -                | 2              | -               | -                  |
| Gazinoghoru zhoi           | Free                     | -                        | -                             | -        | -         | -                | -              | -               | -                  |
| Adrakho zhoi <sup>d</sup>  | 48                       | 12                       | -                             | -        | -         | -                | 1              | -               | -                  |
| <b>Total</b>               | <b>203</b>               |                          | <b>33.5</b>                   | <b>2</b> | <b>11</b> | <b>1.5</b>       | <b>22</b>      | <b>76</b>       | <b>11</b>          |

<sup>a</sup> Granted by the shareholders. <sup>b</sup> Purchased with arable land. <sup>c</sup> Including one share up-graded by the shareholder from *charsthogh* to a regular *sorogh*. <sup>d</sup> Shoat and Mehlp villagers own the remaining water turns of this channel.

Source Author's own survey, 2001

remaining part of the channel is aligned through hard rocks and is quite stable. The whole length of the channel needs annual repair, which is generally carried out in April. The regular turn-based irrigation then starts in the last week of April or the first week of May, depending on the weather conditions. The date for the annual repair is fixed by mutual consensus of the shareholders and then properly announced, to inform all the shareholders at least a couple of days before the commencement of the task. During the repair work the presence of all shareholders is compulsory. As there is more than one household per water turn in many cases, all households sharing a single turn send one person each for the maintenance work, on a turn basis. In case of absence, the persons or the shareholders (according to the situation) are fined up to Rs. 100 per day, which is then used to feed the workers.

The defaulters' fine is mostly levied, collected and consumed on the same day: Three persons are relieved from the maintenance work, and are responsible for buying necessary food items from one of the village shops. The purchase is written up to the credit of the absentees; and thus lunch is prepared for the workers. The defaulters pay the village shopkeeper later, at their convenience.<sup>93</sup>

<sup>93</sup> Almost all households of this village buy food items and other necessities of daily life from the local village shops on credit (*khata*). The households also borrow cash from these shopkeepers for other needs as well. This is therefore one of the easiest ways to realise a fine from a defaulter – in an indirect form, without any personal contact. Repayment is done both in cash and kind. No time limit is specified for such loans and normally the credit (*khata*) is cleared once or twice in a year. This is a common practice not only in this village, but also in other parts of northern Pakistan. In this case the repayment price is not adjusted to keep pace with increasing food prices, as is done in Yasin valley (cf. DITTRICH 1997: 35 & 1998: 312).

The Golo zhoi channel was redesigned once in the past. Due to a landslide, it was totally damaged, and most of it had to be reconstructed and newly aligned. At that time the water rights were redefined, and a few households who were unable to participate in the reconstruction work consequently lost their water shares. There are 12 water turns in this channel, shared by three clans. At present, the Nasketek clan has the maximum number of water turns (an average of one turn per two households), followed by the Bulay clan (cf. Tab. 3.6).

In addition, the main section of this channel has been renovated and upgraded twice, once with the financial assistance of the local government and rural development, and the second time, sponsored by AKRSP. After these two renovations, the channel's water-conveyance capacity improved considerably. Consequently, one new water turn was added. The shareholders granted half of this turn to a household of the Bulay clan, and the remaining half to a Shadestay household. There is more than enough water in the channel, so there is no need to maintain such a strict regulation of water allocation. Nevertheless, the old system of turn-based irrigation is practised for the general convenience of the households, and to avoid any conflicts or misunderstandings among the shareholders on the priority of access and duration of use.

## II) Upper Part of the Village

In this section there are a total of five irrigation channels. All of them are taken out from seasonal streams fed by both snowmelt and perennial springs. Water shortage begins to be felt around the second week of July. By mid August, all of the channels except one are almost dry. All the absentee landlords have their water shares in these channels, and as in Khot valley (cf. BAIG 1997: 168), their tenants are accountable to the irrigators for providing the required labour and other responsibilities.

The water distribution system is based on *sorogh* throughout the season. One case from this section is presented below.

### Uzmo Zhoi

This is one of the longest irrigation channels of the village, serving the southeastern section of the upper part of the village. It is taken out from a tributary of the main stream called Uzmo gol. The headworks of the channel are prone to avalanche hazards. This channel consists of four sections, with a total length of more than five km. The main sources of water are snowmelt and perennial springs. The watershed of this channel is small in area, but the accumulation of snow in its deep gorges and ravines as a result of avalanches and wind action is high. Therefore the discharge of water at the headworks remains sufficient for most parts of the season, although there is a high degree of fluctuation between the highest and lowest flows, both seasonally and diurnally. To control this and to minimise the seepage of water and distance factor, the water-user community has adopted a special measure. From the headworks up to a place called *ghoschar* (small waterfall) there is a single channel, and except for the headworks itself, this section is stable and safe. From there, the channel is divided into two. One part flows directly down to the village through the *ghoschar*, and the second makes a big loop before it rejoins the former part down in the village. The direct segment is about 2

km long, and more than half of the area it flows through is prone to landslides. Before 1996, this channel had to be closed for about four years due to leakage and other maintenance problems. In 1996, the shareholders repaired this segment of the channel with financial and technical help from CADP. Since then both parts are functioning.

The other part of this channel flows in a loop through a relatively stable area. There is a natural depression along its course that has been converted into a pond for water storage (see below). The area under the command of this channel mostly consists of steep slopes, so nighttime irrigation is not possible. Therefore every evening, after reducing the flow at the headworks, a fixed volume of water is diverted into the natural pond for overnight storage. The individual shareholders perform this task in the evening subsequent to their turn. This practice has two distinct benefits. First, the pond is very near to the village compared to the headworks, so it takes less time for the water to reach the arable land. Additionally, in the early morning hours the pond also compensates for the insufficient water volume caused by low temperatures in the watershed area. In the autumn season, due to low discharge at the headworks, this overnight storage is the main source of water. As this channel is very long, the shareholders have appointed a watchman (*mer zhoi*).<sup>94</sup> It is this watchman's responsibility to divert water into the channel at the headworks at early dawn, and to maintain a vigilant supervision of the headworks during the peak discharge period from midday till evening. He is also responsible for decreasing the amount of water flow in the channel at the headworks in the evening. The opening and closing of the natural pond, on the other hand, is carried out by the respective shareholders in early morning and late evening. In the autumn season, many other households of the upper part of the village are also dependent on this channel for irrigation, especially for sowing red clover and winter wheat.

The headworks of this channel is repaired and maintained in autumn, to avoid the problem of avalanches in spring. This sometimes creates problems during the irrigation season: if the headworks have been damaged beneath the avalanche cover, it may then need an urgent emergency repair in the month of July. The other parts of the channel are mostly stable and safe, needing only minor repairs, which are carried out in spring, in the month of May. After completing the annual repairs, the shareholders establish the turn system for the entire summer season by mutual consensus.

Since there are 24 water turns in this channel, the number of shareholders is too great for each to have one *sorogh* per day during the growing season. Therefore, the shareholders are grouped into two shareholders per day. They divide the water between them and irrigate their fields accordingly. These pairs are constituted only for one sea-

<sup>94</sup> The actual name *mer zhoi* is derived from the Persian language, and is a combination of two words, *mir* and *joi*; meaning the "chief of a channel." This is generally a paid position of authority, held for the whole season or longer. The *zhoi ual*, on the other hand, is a temporary post, without authority. He is responsible for caring for a vulnerable section of the channel or headworks on seasonal or daily basis. In most cases, a shareholder spares a person from his family or a co-shareholder during his turn for this purpose. This is mostly practised when no *mer zhoi* is present, or subject to the physical condition of the system and the discharge situation at the headworks. The power and responsibility of a *mer zhoi* vary from channel to channel, depending on the system of organisation and the physical structure. For comparison see ISRAR-UD-DIN (1992a; 1996, 2000); KHAN et al. (1994) and BAIG (1997).

son (cropping year), and in the next season new groups are formed. The individual households are placed in groups according to their will. This channel is very important because it irrigates about 150 fields, along with plantation and grass, without any extra or supplementary sources. In only a few cases are there other channels and springs available as secondary sources.

In the past a severe water crisis occurred in the command area of this channel. The channel was totally damaged by landslides, and it was not possible to repair it in time for the next season. An emergency measure was arranged by the shareholders with the help of the whole village community. They constructed another channel from the seasonal stream to the west of the village (Rung gol), and diverted into it their share of water from other channels that irrigate the summer settlements. As the water at the headworks of the newly constructed channel was variable in quantity, and the area to be irrigated was now larger than before, they constructed a temporary water tank for overnight storage and to regulate water supply early in the morning. That channel is still in use, but not for the original purpose.

As this new source of water was not reliable, the old system was redesigned. An additional section was added to it, drawing water out of the natural pond. In the initial days, it was very difficult to maintain parts of this new section: the system was under heavy stress and channel breakages were taking place frequently. In response to this, the community introduced a different system for daily supervision, dividing the newly constructed channel into two main parts. The vulnerable section was equally divided among all the shareholders for vigilant supervision and regular daily upkeep, while the stable part remained the responsibility of the respective daily shareholders. This model worked very well. Every group, considering it an important responsibility, tried their best to adopt all possible measures to stabilise their section on a permanent basis, until the entire channel was finally stabilised and remained safe for the whole season. Thus with the passage of time the strict vigilance became less and less necessary, until the whole extra management and sharing of daily repair responsibilities were no longer needed. Since then the entire length of the channel has once again become a single unit, subject to collective repair.

### III) Summer Settlements

There are two main summer settlements, Nashtani and Romolasht, and their cultivated land falls under the command of three irrigation channels. A single clan has lately ameliorated Nashtani. They constructed a new channel – the uppermost that leads out of the seasonal stream. As there was (and still is) seasonal and diurnal water shortage at the source of this channel, the downstream shareholders applied a new rule regarding access to and share of water from this channel. Because of the low discharge, the shareholders are not allowed to divert water into their channel before 10 o' clock in the morning; also the downstream channels, which were constructed earlier than this new one, have preferential rights to the available water. This rule is strictly applied in years of low snowfall or whenever there is a shortage of water in the stream.<sup>95</sup>

<sup>95</sup> The same procedure is also followed in the Karakorum. For further details see KREUTZMANN (1988, 2000b: 100).

Two irrigation channels, Torlashto zhoi and Mullashto zhoi, supply water to the upper and lower sections of Romolasht summer settlement. These channels are relatively stable and need only daily supervision during the season. Sufficient water is available, and there are also many perennial springs feeding these channels. The water distribution system is also different here, as all the principal clans have shares in both channels. In the former channel, Torlashto zhoi, the Somalay clan is the dominant shareholder with 14 water turns, while the Bulay and Shaipay clans have two *sorogh* each. In the Mullashto zhoi, the Bulay clan has the lion's share: of the 13 water turns assigned to this channel, they have 10 *sorogh*. The Shaipay clan owns two of the remaining turns and the last turn has been granted to the village priest from the Nasketek clan, along with the arable land. In addition to the three irrigation channels, six households of the Shaipay clan have a single water turn of 24 hours in another large system that exclusively irrigates the summer settlements of Shoat and Mehlp villages.

#### IV) Adrakho Zhoi

This is one of the longest irrigation channels in Mehlp valley, and has many secondary extensions. The main channel is more than six kilometres long, from the headworks at Bargon to the tail end at Nokuro Tek. Its main source is Bargon stream, which originates from two small glaciers in the upper reaches of the valley. Other sources are permanent springs, seasonal snowmelt and occasional torrents caused by rain and snowmelt. The torrents also function as safety valves for diverting water at critical times. The command area of this channel is more than 500 acres. The channel is about half a meter in width and it carries a good amount of water, approximately 2.5 *khorarogh*.<sup>96</sup>

The shareholders in this channel are divided into four groups having 12 water turns each – namely *Mehtari*, Khushay, Matumay, and Dok (place name) – thus making a total of 48 regular water turns.<sup>97</sup> Water in this channel is equally divided into four turns daily, one per group, and it takes 12 days to complete one rotational cycle. Aside from these regular water turns, there are some households close to the headworks who are allowed to take an unlimited amount of water (*charsthogh*)<sup>98</sup> for their requirements, without any time limit. Also one household of the Shaipay clan in Odier village was granted a piece of barren land by the *Mehtar* for development; they have a single water

<sup>96</sup> *Khorarogh* is a local unit for measuring water discharge in a channel. Since water mills are designed according to the availability of water during the milling season, this unit of measurement varies from place to place, depending on the size of the millstone. It is estimated to be 2 to 3 cusecs (ISRAR-UD-DIN 1992a: 126 and BAIG 1997: 160).

<sup>97</sup> Khushay and Matumay are the clans living in Shoat village. They have an equal number of water turns (*soroghs*) in their particular section. Another 12 water turns are allotted to a locality called *Dok* (a relatively higher location), where the aforementioned clans, along with others, also have a number of *soroghs*. The remaining 12 *soroghs*, as the name indicates, were granted by the *Mehtar* to households and clans. As land and water were the only resources, the *Mehtar* granted both of them to his favourites – notables and relatives – and in rare cases to the poor people (c.f. STALEY 1969; ISRAR-UD-DIN 1992a and BAIG 1994, 1997). Along with a few other households, the Kushay and Matumay clans are the main shareholders in this *Mehtari* category of water turns.

<sup>98</sup> For more details on *charsthogh* see ISRAR-UD-DIN (1992a, 1996, 2000) and BAIG (1997: 162).

turn on the tail end of this channel. Currently six households are sharing this single *sorgh* in this channel. The secondary channels carry water according to the distribution pattern on specified days and hours.

The Adrakho zhoi is a large system, and therefore needs a regular organisation, much vigilance and continuous supervision throughout the irrigation season. For this purpose, a watchman (*mer zhoi*) is appointed by the water-sharing community to look after the channel. The system of physical maintenance applied here is also different from that of the other channels. The whole channel is divided into three sections based on the physical conditions, i.e., stable, weak and vulnerable. The physically stable section is divided equally among the shareholders for yearly repair purposes; these section divisions are locally called *ber* or *phi*.<sup>99</sup> Every shareholder has a number of *ber* at many different locations along this stable part of the channel. The relatively weaker sections are collectively maintained by all the shareholders. The vulnerable parts are once again equally divided among the shareholders, and each shareholder is responsible for the upkeep of his section throughout the irrigation season.<sup>100</sup> Along with his other duties of overseeing the daily water allocation and distribution among the shareholders, the watchman is also responsible for informing the appropriate *ber* owners in case of problems in the smooth flow of water or potential risk of channel breakage. The *ber* owners then immediately begin whatever maintenance work is required. The regular shareholders pay for the services of the *mer zhoi* at the end of the season. Shareholders close to the intake of the channel are excluded from the repair work; likewise, they are not compelled to pay the watchman's charges. However, they usually help him in their section of the channel.

## V) Other Sources of Irrigation

There are other minor sources of irrigation in the village. These include small perennial and seasonal springs, ponds and small channels that have been dug out by a few individual households.<sup>101</sup> Some of these, especially the springs and natural ponds, are supplementing the existing irrigation channels. The channels constructed by individuals are shorter in length and do not need any special organisation for operation and management. They have been taken out from various sources to irrigate suitable pieces of lands. The beneficiary households repair them and use them to irrigate their fields at their convenience; no turn system is practised. There are many such minor channels

<sup>99</sup> *Ber* and *phi* are both local units of measurement, mostly relevant to how the irrigation channels were divided into repair units per shareholder in the past. Although both terms have the same meaning, they are not the same length. For more details on this system of distribution and management see ISRAR-UD-DIN (1992a, 1996, 2000) and BAIG (1997).

<sup>100</sup> The length of *ber* or *phi* in the stable section of this channel is equal to approximately 20 meters at one location, and in the vulnerable sections, it is sometimes less than two meters. In both cases it is measured according to the local system.

<sup>101</sup> Some of the perennial springs are considered communal property and, as such, are included in the existing water turn system. According to the traditional rules, no individual is allowed to take these springs into private ownership. Most of these springs seep into the natural drainage. At the same time, there are other springs owned by individual households as private property. Other households are also allowed to benefit from them and take water for drinking and irrigation, but for the latter purpose, the owners are usually preferred.

and sources, and most of the area under their command is given to the plantations and fodder crops.

### **Irrigation from the Natural Pond**

There is one pond in a small depression covering an area of about one acre. Seasonal snowmelt and spring water accumulate here. The pond also receives water from up-slope sources through surface and underground drainage. Sometimes the concerned households also divert their nighttime water from the channels directly into the pond, to increase its water level for later use. Due to mass movement, it became possible to use this water for irrigation about 25 years ago. In the late 1970s, an outlet was dug on one side of the pond, which is now regulated according to the needs of the concerned households. Although the command area under this source is quite small at present, there exists a good possibility of extending it to include the lower part of the village in case of extreme water shortage in the other channels. Another limiting factor for the optimal use of this source is the constant changes taking place in the morphology of the command area due to landslides. This area cannot be converted into arable land, because the process of extending the irrigation channels and water application itself further accelerate the ongoing mass movement manifold. About ten households are using this water for irrigation purposes. Except for a single household, all of them are partially dependent on it.

There is another minor source of irrigation that directly depends on this pond. This is a perennial spring, *Khashkir utch*, located a little down-slope towards the north. The command area under this spring covers approximately four acres. About 12 households have their arable land irrigated by this source, and a few fields are still under food crops. The whole area is prone to landslides, and regular undercutting by the river has also destroyed parts of the arable land (cf. Chap. 3.4.3.1). At present, most of the area is under grass and plantation and needs regular irrigation during the season.

Other minor sources of irrigation are the channels that were primarily constructed for watermills. There are six watermill channels in the village, half of which are also used to irrigate at least some piece of arable land. A few households of only two clans, Shaipay and Bulay, have land under the command of these channels. The entire area is given to plantations. These channels are repaired and maintained primarily by the mill owners in spring and late summer. During the peak discharge period and after flash floods, the landowners only are entitled to divert some of their irrigation water here, to save their plantations. Since 2000, one of the watermill channels has been redesigned. Its headwork has been totally reconstructed to run a small micro-hydroelectricity plant (cf. Chap. 5.7.2).

### **3.4.5 Land in Village Ownership**

Besides the above-mentioned pastures (cf. Chap. 3.4.4.1), there is one high-altitude pasture owned by the whole village community as a common property. It is also a reserved area for the collection of firewood, and all the households have equal access rights. Actually it is serving as a model area for common-property resource management in the village; therefore equity is strictly maintained. The pasture is located on

the eastern side of the village and is part of the watershed of the main perennial stream, called *Khotocho gol*. The area has an altitude of approximately 3,600 m to 4,000 m, and includes a few peaks above 5,000 m. There are two small patches of mixed birch and willow groves. One is under common property and is collectively harvested by all the villagers once every four to five years. The other is owned by a family of two households in the village as a private forest.<sup>102</sup>

All households of the village share equal access rights to the resources of this pasture, including sheep and goat grazing, fodder and firewood collection. The neighbouring villages also have free grazing rights for cattle and yaks, and those villages located within Mehlp valley, i.e. Shoat and Mehlp, have an extra right to controlled sheep and goat grazing. Nevertheless, none of them are allowed to extract any other benefit from this pasture, except for a few households from Shoat village who have their *moshin* within the limits of this pasture. These *moshin* owners are entitled to harvest only the one product; they are not allowed to collect anything else (fodder and firewood) there (cf. Tab. 3.7). Aside from the Shoat and Mehlp villagers, no other outsider is allowed to graze goats and sheep within the territorial limits of this pasture. Even the absentee landlords who own arable land in the village are not allowed to do so, unless and until they settle in the village and establish a regular household. However, similar to the tradition in Yasin (HERBERS 2000a: 191), households within the valley are permitted to hire themselves out as seasonal paid labour (*hostagani*). In this capacity, they are allowed to use the communal pasture for the whole summer season to graze sheep and goats belonging to an outsider, who otherwise would have no direct access to this pasture, irrespective of his land-holding status (cf. Chap. 4.3.2.4). This high-altitude pasture is used for both free and daily-turn grazing from June until the end of September. The government has recently forbidden game hunting of any kind.<sup>103</sup>

Other benefits exclusively owned by Odier villagers include the seasonal collection of fodder and fuel wood. Since the villagers have declared the area a permanent reserve area (*saq*) for the collection of fuel wood, the pasture is utilised in consultation with watchmen (*darophal*). This is a large area that has been divided into many named sections with clear boundaries, demarcated by small streams and minor ridges. Every year fuel wood is extracted in early spring and late autumn from different sections of this pasture on a rotation basis. The community agrees upon the general procedure of resource extraction through unanimous decision after the Friday congregations. Two things are decided prior to the relaxing of the *saq* ban: first, which section of the pasture area is to be temporarily opened to the users; next, the duration of the opening period,

<sup>102</sup> In the later period of the local rule, a member of the Shaipay clan was a state official in the *Mehtar's* court. He actually worked in the Royal kitchen as a storekeeper. As a sign of respect, he was popularly known as a *Dewan Begi* in the village. The ruler gave him these two patches of birch groves as a gift. Later on he gave the bigger patch to the villagers, and retained the smaller one for himself. Using his position, he also got arable land in other villages and was able to provide his clan members with temporary relief from compulsory forced labour and other state responsibilities, as well.

<sup>103</sup> During the period of local rule (before 1970) this valley, together with the surrounding valleys within the watershed, was also a game reserve for the local ruler and notables of the then-administrative district of Torkhow.



i.e., the number of days. (This also determines the number of loads of firewood that may be extracted by the households, since the villagers are entitled to take only one load per day.)

Generally, all the households have to collect their share from the specified area within the stipulated time. This time period is extended for absentees (including the watchmen and the priest) for a maximum of three days. Any household unable to collect its share during the extended opening period cannot claim it at any other time or occasion. These time limits create some difficulties. Since all the villagers are busy extracting firewood from the specified area at the same time, households without able-bodied men at home are in an unfavourable situation: there is no one whom they can request to help. Likewise, the watchmen (*darophal*) are at a disadvantage. They are busy implementing control mechanisms and vigilantly supervising the process of fuel extraction; thus they cannot extract their own share. The village priest faces the same dilemma, and cannot find any help in the village for collecting his share (cf. Chap. 5.5.2.4). To protect the shares of those households without able-bodied men at home, and to make the benefits equitable for all the co-owners, including the watchmen (*darophal*) and the village priest, a special procedure is generally followed. For this purpose, a small section within the temporarily relaxed area is reserved for them, and they are allowed to send their relatives and neighbours to work on their behalf. In this case, the one-load-per-day restriction is lifted, permitting the proxies to collect the absentees' entire share even in a single day.

During the extraction period, all the members are checking up on each other; the watchmen (*darophal*) are vigilant as well. Any violation of the prescribed extraction rules by a co-owner results in the suspension of his access rights for the time being, together with other penalties, as decided by the community. In case of any emergency or crisis situation in the village, the extraction process is suspended for a few days. Any household can grant its share (number of loads) to any other household within the user group. Additionally, any household within the resource user group, as well as any outsider, can request the community for a grant of firewood or minor building material from the pasture area.<sup>104</sup> Normally the village priest or elders present such cases to the community after the Friday congregation in the central mosque, and the decisions are made immediately, in a more or less informal manner. For approximately the last three decades, however, the villagers have discouraged this process, and nobody has been awarded any special permission for this purpose. The footpath leading to this pasture from the village passes through steep slopes and difficult terrain. Because it needs regular repair, an extra grant of six loads of firewood is given to the household(s) that undertake the repair work and construct small, temporary bridges over the stream.

The villagers have appointed three watchmen (*darophal*) for an indefinite time to look after this *saq* area. There are many criteria for the selection of *darophal*. Usually clan affiliation is not considered so important; rather, personal qualities carry more weight. The person should be strong, courageous and bold, and mostly straightforward persons

<sup>104</sup> Generally, plants such as artemisia and wild rose were also used as minor building material for house construction. These were used in constructing the roof above the ceiling, and were layered between wood and mud as a measure for conserving timber.

are preferred for these positions. Nobody can offer himself; he must be nominated by others. The final selection is then made on the spot by mutual consensus. The *darophal* are accountable to the villagers and are not paid either in cash or kind for their services. Rather, they are allowed to collect double the share of a normal household's firewood during the opening period as reward for their services.

The watchmen have the full-time duty of patrolling the whole pasture territory and controlling free riders, both from Odier as well as from the neighbouring villages. Early spring is the most critical time, when free riders from the neighbouring villages mostly come to pasture. During this season when there is an acute shortage of firewood and not so much agricultural work, most of the neighbouring villagers are occupying the summer settlement, which is quite close to this pasture. At the same time, the ground is softened from snowmelt, allowing the uprooting of different artemisia species. All this means increased responsibility for the village guards. In such situations the *darophal* may request the villagers for more help and conscript young men for the daily patrols. The different settlement sections of the village provide them with this extra manpower, and the volunteers are then allowed to bring home one load of firewood as remuneration for their services. If a free rider is caught red-handed, the products he has collected along with his contraband implements are confiscated and given to the person who caught him. But usually, when the free riders see watchmen or guards, they try to save their implements and leave the collected products on the spot, disappearing from the scene as quickly as possible to avoid humiliation. These actions of the village guards and other temporary assistants are highly appreciated and praised by all villagers. Similar to common property systems in other areas (cf. MCKEAN 1992a: 83f.), most cases of theft and free riding stem from the neighbouring villagers, and instances of offences by co-owners are almost negligible. There is always the probability of a *darophal* misusing power and favouring his relatives and friends. Therefore the watchmen are also monitored for their compliance with the rules and performance of their entrusted responsibilities.

Many households visit this pasture for a variety of reasons during the whole summer season. The sheep and goat grazers are present in the pasture area daily from morning till evening. Collection of dung for fuel is also free, and many households visit the pasture for this purpose as well. It is practically impossible for anybody from the village to break the rules. If anybody – including the watchmen – fails to guard the resources when he was in a position where he was capable of doing so, he is humiliated in public,<sup>105</sup> usually after the Friday congregation. If he is a watchman, he is immediately removed from his position and heavily punished. The punishment varies, depending on what excuse the defaulter presents to the villagers. His past record is also screened to determine whether his negligence was intentional or an unavoidable human error. The usual fine ranges from the slaughtering of his ox, sheep or goat to suspending his access and withdrawal rights for one season. Such systematic proceedings are impossible to carry out in the presence of all the members, therefore the village elders, along with the watchmen, discuss the whole problem and reach a decision in the presence of the

<sup>105</sup> This is a common and very effective punishment for free riders in a closed rural society, and is also practised elsewhere. For more details see RHOADES & THOMPSON (1975) and MCKEAN (1992a & b).

defaulter. The concerned members immediately implement the decision without any discussion or delay, and the defaulter also participates in the event.

### 3.4.6 Inter-Village Pasture Utilisation Rights

In the absence of any ownership records, the access rights and utilisation patterns agreed upon between and among the neighbouring villages are complex (cf. NÜSSER 1999 and CLEMENS & NÜSSER 2000). They usually depend on the evolution and successive utilisation patterns of the individual settlements. In principle, every village has its own territory as an owner; but in practice, the villagers also respect their neighbours' limited or secondary access and utilisation rights (Tab. 3.7). This system of inter-village co-operative management and utilisation is restricted to grazing rights over some pastures. This applies to those pastures that are relatively large in size and simultaneously used by many villages. Actually the de-facto ownership rests in one village, and in many cases the respective owners have already declared these pastures as permanent reserve areas (*saq*) (Map 3.5: 107). In most cases, the boundaries of such pastures are not yet settled among the co-users. However, the secondary utilisation rights of the neighbouring villages are very old accorded traditions, and have been accepted as such by the concerned villagers. These include classified rights either for seasonal grazing of sheep and goats or free grazing of cattle. In the meantime, some households from neighbouring villages have their fodder resources (*moshin*) in these pastures. In this case, they are only allowed to collect their *moshin* and nothing else (cf. Tab. 3.7).

#### 3.4.6.1 Controlled Sheep and Goats Grazing

Different pastures are used for grazing of sheep and goats, according to the season. In the following pastures, some households of Odier village share seasonal sheep and goat grazing rights along with the neighbouring villages.

##### 1) Winter Pasture (Shol)

This is a vast pasture, located on the right bank of the Mehlp River between 2,600 and 2,900 m. It lies in the southwestern part of the village and is very near to the winter houses. The winter pasture has a southern exposure and is comprised of different species of artemisia and other drought-resistant plants. Almost 40 percent of the total area of this pasture is prone to mass movement and landslides, and is covered by rock debris (*der*). Due to these hazards and physical constraints, the pasture cannot be converted to any suitable use other than seasonal goat grazing; likewise, there is no possibility of constructing an irrigation channel and reclaiming the land for cultivation. The ownership of this pasture is not determined, and all the neighbouring villages have their own claims on it. Nevertheless, all the villagers have mutually accepted the traditional access rights: four villages use this pasture simultaneously for sheep and goat grazing. Two of these villages are located within Mehlp valley (the study area), and the other two are located outside of the valley.

The upper Rayeen villagers are the de-facto owners of this pasture, and they have declared the lower part of it to be a reserved area (*saq*). The pasture is free of snow most of the winter season; therefore both Odier and Rayeen villagers use it for goat grazing in winter and spring. The Shoat villagers usually use this pasture for grazing goats in the

autumn season. The households of Ghorda utilise it for sheep and goat grazing throughout the year. Both Ghorda and lower Odier households also collect firewood from this pasture in early spring. The de-facto owners do not accept this, and they regularly patrol the lower part of the pasture for free riders from March to the end of April. The upper part, close to Odier village, mostly consists of rock debris and landslide scars, and there is very little potential for plant growth. There are a few springs with limited grass cover nearby; and Rayeen villagers also use this part for free grazing of young calves in the summer season.

Despite the physical constraints and ownership problems, the Rayeen villagers made an unsuccessful attempt during the late 1980s to construct an irrigation channel from Mehlp *gol* to irrigate the whole area. They spent a considerable amount of money and constructed a five-km channel section over a two-year period. Due to persistent mass movement process, it became clear to Rayeen villagers that there was no chance of success; therefore, the whole project was abandoned once and for all. Additionally, another setback to this project was the change in government. The local member of the provincial assembly, who was favouring this project also lost its position.

## II) Char and Lashto Sor

This area is located to the north of the village. In the late 1950s an attempt was made to construct a long irrigation channel (about 20 km), extending from the upper part of Mehlp *gol*, to irrigate some parts of this area and Ghorda Lasht. After the channel was completed (cf. ISRAR-UD-DIN 1965: 166 Tab. 14), the area was divided into plots and distributed among the households of two villages, Odier and Shoat. Consequently, many households of Odier village also received some land under the command of the new channel. As this was a huge structure, most of the local households (except for a few households of Ghorda village) were not prepared to take over the operation and maintenance responsibilities. At the same time, the whole state was in the grip of large-scale political disturbances. Therefore, the project was abandoned before the final land development and cultivation of crops.<sup>106</sup> The entire area reverted once again to being a winter and spring pasture of the neighbouring villagers. Most of the area has very steep slopes, ranging from 50° to almost 80°. This condition together with its southern exposure keeps it snow-free throughout the winter season. There are some perennial springs with relatively low discharge. The Shoat people mainly use the area as winter and spring pasture. Some households of Odier village who live near to this area also use it for a few days in winter for goat grazing. There is no problem as far as the ownership is concerned. Because of the location of the land allotted to the Odier households by the former state officials, the Shoat villagers also honour this right of goat grazing.

For a long time, the villagers of Shoat and Ghorda have declared the whole pasture as a reserved area (*saq*) for fuel-wood collection. There are four permanent watchmen, two from each village, to properly guard it against free riders. Once every four to five years the *saq* ban is relaxed and the area is opened to the co-owners for specified days. During

<sup>106</sup> During the early 1980s, the residents of Ghorda village once again reconstructed the whole channel. Due to the opposition of the Mehlp inhabitants, however, the matter was brought to court and later on it was again abandoned.

this period, every household is allowed to collect and transport an equal number of loads of fuel wood. The watchmen are not paid, but are allowed to collect extra loads of firewood from the commons during the opening period. The Odier villagers, who are also stakeholders here, have accepted this utilisation status. The fodder, except for *moshin*, is not collected by the neighbouring villagers, but is left on the land for seasonal grazing. Some small calves are also pastured here for free grazing in summer, to avoid the danger of predators in the main summer pasture. One clan of the Odier village (Nasketek) has its *moshin* in this pasture area. As per traditional rules, these households are only allowed to collect their *moshin* and nothing else from this pasture.

### III) Spring Pasture (Yor Teli)

The spring pasture is located very close to the summer settlement of Romolasht. A small willow and birch grove separates this pasture from Nichagh (cf. Map 3.5). A few families of lower Rayeen village own this forest and equally divide the firewood after it is cut. The pasture covers a vast area of more than 10 sq. km. The Rayeen villagers have founded summer settlements at four different locations with limited cultivation. These days, two of the summer settlements are deserted and no longer visited during the summer season. Only one family still occupies the other two seasonal settlements. Water shortage is the main problem hindering the extension of the cultivated area in the summer settlements. The Rayeen villagers have reserved a part of this area for the collection of firewood. Fodder is also collected from this area without any restriction, and the pasture is mostly used for sheep and goat grazing. The Odier villagers are allowed to graze their sheep and goats here during spring and autumn, but they are not allowed to collect firewood. Many households of Odier have their *moshin* in this pasture, but they are not allowed to collect any fodder except their own *moshin*. As this pasture is very near to Odier, the Odier villagers regularly collect firewood illicitly in spring and autumn. It is very difficult for the de facto owners to patrol the whole pasture area.

#### 3.4.6.2 Seasonal Free Grazing of Cattle

All the main pastures of the five neighbouring villages – Istrau, Werkup, Odier, Mehlp and Khot – are contiguous, without any physical barriers. For seasonal free grazing of cattle and yak, there is no restriction on the selection of pastures i.e. all the above-mentioned villagers can use any pasture they like. But in practical terms, only yaks can exploit most of these pastures, and they usually remain at the highest altitudes throughout the season. At present, very few households in Khot, Mehlp and Odier villages own yaks. Free grazing starts in the last week of April, and the yaks are the first to be let out. Non-lactating animals follow in May or June, depending on the weather conditions. The grazing period lasts till the end of September for non-lactating animals, and yaks remain in the pasture until the end of December, depending on the depth of snow and the danger of predators (wolves) (cf. Fig. 4.3).

In the case of cattle, all the owners prefer to keep them in nearby pastures for free grazing. But sometimes they too cross the watershed boundaries and penetrate into other pastures. The owners usually visit their animals once or twice during the free-grazing season. They start collecting their free-grazing animals in September, and it sometimes takes days or even weeks to collect them all together. In particular, finding and identify-

Tab. 3.7 Inter-Village Pasture Utilisation Systems in Mehlp Valley

| Pastures<br>(Altitude in Meter)  | De facto owners & users        | Primary<br>owners (Hh) | Secondary<br>users (Hh) | Resources   | Extraction<br>system | Watchmen<br>(Darophal) |
|----------------------------------|--------------------------------|------------------------|-------------------------|---|----------------------|------------------------|
| zKholoch<br>(3100-4000)          | Odier Villagers                | 120                    | -                       | Firewood collection & seasonal grazing of livestock | Reserved             | Yes                    |
| -do-                             | Shoat & Mehlp villagers        | -                      | 100                     | Seasonal sheep, goats & grazing                     | Allowed              | No                     |
| -do-                             | Shoat villagers                | 06                     | -                       | Moshin collection                                   | Allowed              | No                     |
| -do-                             | Neighbouring villages          | -                      | > 400                   | Seasonal free grazing of cattle & yaks              | Allowed              | No                     |
| Char & Lashto Sor<br>(2700-3500) | Shoat & Ghorda villagers       | 117                    | -                       | Firewood collection, sheep & goats grazing          | Reserved             | Yes                    |
| -do-                             | Odier villagers                | -                      | 65                      | Seasonal sheep & goats grazing                      | Allowed              | No                     |
| -do-                             | Odier villagers                | 10                     | -                       | Moshin collection                                   | Allowed              | No                     |
| Shol Pasture<br>(2600-2900)      | Upper Rayeen villagers         | ca. 100                | -                       | Firewood collection, sheep & goats grazing          | Reserved             | Yes                    |
| -do-                             | Odier Shoat & Ghorda villagers | -                      | 180                     | Sheep & goats grazing                               | Allowed              | No                     |
| Your Teli<br>(2900-3700)         | Lower Rayeen villagers         | ca. 100                | -                       | Firewood collection, sheep & goats grazing          | Open access          | No                     |
| -do-                             | Odier villagers                | -                      | 65                      | Sheep & goats grazing                               | Allowed              | No                     |
| -do-                             | -do-                           | 11                     | -                       | Moshin collection                                   | Allowed              | No                     |
| Khogol<br>(3200->4000)           | Werkup villagers               | ca. 270                | -                       | Firewood, fodder collection & livestock grazing     | Open access          | No                     |
| -do-                             | Khot, Mehlp & Odier villagers  | -                      | Yak owners              | Free grazing mainly yaks (cf. Chap. 4.3.2.6)        | Allowed              | No                     |
| Mehlp Aan<br>(3500-5000)         | Mehlp villagers                | 160                    | -                       | Firewood, fodder collection & livestock grazing     | Reserved             | Yes                    |
| -do-                             | Khot, Mehlp & Odier villagers  | -                      | Yak owners              | Free grazing (mainly yaks)                          | Allowed              | No                     |
| Khot Aan<br>(3200-5000)          | Khot villagers                 | ca. 350                | -                       | Firewood, fodder collection & livestock grazing     | Reserved             | Yes                    |
| -do-                             | Mehlp & Odier villagers        | -                      | Yak owners              | Free grazing (yaks only)                            | Allowed              | No                     |
| Istarwan<br>(2900-3700)          | Istaru villagers               | ca. 140                | -                       | Firewood, fodder collection & livestock grazing     | Open access          | No                     |
| -do-                             | Khot, Mehlp & Odier villagers  | -                      | Yak owners              | Free grazing (yaks only)                            | Allowed              | No                     |

Hh = households.

No = not relevant

Source Author's own survey, 2001

ing the young animals is quite problematic. Older animals can be easily identified by their owners and often by the neighbours too; while the oxen can be identified by the entire village. This is so because the older animals are usually hired out for threshing and ploughing in the village.

### **3.5 Summary: Resource Ownership and Management Mechanisms**

The available natural resources within the territorial limit of a village are kept in different ownership regimes for effective management. For subsistence sustenance at household level, products from these ownership regimes are combined in an integrated manner. Land in individual ownership is also used systematically for growing different crops, tree plantations and grass etc. In this case, the pattern of utilisation is systematic, and especially the long-term productivity of the resource base is always cared for. To utilise all the resources, not only food for the household members is considered, but also fodder for the livestock. Especially the provision of winter fodder stocks is given high priority at all the levels of resource ownership, ranging from households and clans to the whole village. The importance of winter fodder is clear from the area given to fodder crops and grass at household level (cf. Map 3.3 and Map 3.4) the management of *moshin* at clan level, and the reservation of pastures for grazing and haymaking by the village community at the village level. Most of the information relevant to land ownership, access rights in the commons, as well as physical access to pasture and arable land for various activities is maintained as part of the traditional knowledge and transmitted orally from one generation to the next. Land transaction is usually conducted in public in the presence of the village elders, and the secondary uses and rights are also legitimised through this process.

Common property resources are graded according to their importance for production and reproduction, and only in some cases (firewood) is equity maintained at a higher level. Access to any resource unit is always attached to some duties and responsibilities for the long-term maintenance and smooth functioning of the whole system. To achieve this goal, the inhabitants of the villages maintain multilevel, decentralised and independent institutions. Traditional knowledge and customary law are the basis for conflict resolution at the village level. Free riders and ownership-related problems mostly arise at inter-village levels, due to unclear ownership boundaries. However, the recognition and acceptance of secondary utilisation and access rights of the neighbouring villages greatly reduces court litigations.

Most of the institutions for resource management are informal and are only activated when needed, although there are regular and fulltime officials for the implementation of rules. The central mosque of the village and the neighbourhood mosques function as main interaction points, where the resource users can discuss related issues. The latest steps of the villagers to include more land in the traditional village reserve (*saq*) show their concern about the depletion of common property resources in the villages and demonstrate their desire to take logical precautions for the future.

The unprecedented increase in population of Odier is creating massive pressure on the limited natural resources. On the one hand, landholding size is decreasing day by day,

and on the other hand, the co-owners' share in some resources is also declining, with increasingly long intervals in the rotation system. Meanwhile, the demand for food, forage, fodder, timber and firewood is persistently increasing. Although more area has been brought under individual ownership through land development, the pressure on the communal pastures is still increasing. Despite the apparent sustainable utilisation and management systems provided by autochthonous institutions, the yield and productivity of the pastures is decreasing. However, the villagers comprehend this state of affairs very well, and they are employing all possible means to enhance productivity and keep their resource base intact.



## 4 Traditional Livelihood Systems and Collective Sustenance Strategies

### 4.1 Introductory Remarks on Creative Adjustments

Adaptations or creative adjustments refer to the efficient uses of available resources in the mountainous regions – those usages through locally established autochthonous institutions that maximise opportunities, minimise natural disadvantages and sustain a long-term subsistence livelihood. According to BERKES, et al. (1998: 20) “adaptation strategies refer to practices and rules used by households and communities to secure their livelihood and increase the probability of survival”. These strategies are particularly important and explicitly demonstrated in those mountain regions where the resource base is comparatively scant and productivity is substantially low. Additionally, the impacts of altitude, aspect and other location-specific variables also play a vital role in the regeneration and seasonal availability of natural resources. These constraints – and in some cases, potential opportunities – are collectively known as “mountain specificities” (cf. JODHA 1992, 1997). Altogether, these controlling factors have a considerable effect on the subsistence strategies and survival mechanisms of the mountain communities. To mitigate the negative impacts, mountain communities throughout the world have adopted a variety of strategies. These include diversification of economic activities, co-operation and co-ordination at various levels, reciprocal arrangements and mobilisation of communal labour. To successfully accomplish these strategies, local communities have established a hierarchy of local institutions.

Other manifestations of locally adapted survival systems are resource ownership and exchange patterns, and the integration of space and time through seasonal mobility. Although there are considerable similarities at regional levels, locally specific mechanisms are also common in many cases.<sup>107</sup> FUNNELL & PARISH (2001) have provided in their latest work a detailed review of traditional strategies and adapted livelihood mechanisms and their relationships with the physical environment in the mountain regions of the world. Nevertheless, some of the traditional practices that are considered to be adaptive mechanisms are not confined to mountainous areas alone, but are also found in the lowlands, depending on the local natural constraints.

Functional livelihood strategies are usually based on mutual co-operation and depend heavily on the availability and productivity of natural resources. Most of these co-operative activities have remained dynamic throughout recorded history in the mountainous areas of the world. Generally they are based on different forms of agro-pastoral activities (cf. EHLERS & KREUTZMANN 2000b) and are collectively organised at different levels of social organisations. For this purpose, the inhabitants of mountainous regions

<sup>107</sup> There are many scientific studies on this multi-disciplinary subject for the major mountain regions of the world, covering both historical and contemporary periods. The important ones include: NETTING (1974, 1976); RHOADES & THOMPSON (1975); BRUSH (1976a & b, 1982, 1988); BISHOP (1978, 1990); THOMAS (1979); GUILLET (1980, 1981, 1983); SCHWEIZER (1982); BJØNNES (1983); BRUSH & GUILLET (1985); ORLOVE & GUILLET (1985); CONWAY (1987); ALLEN (1988); BALLAND (1988); JODHA, BANSKOTA & PARTAB (1992); EHLERS (1995, 1996, 2000b); UHLIG (1995); PRICE & THOMPSON (1997) and MÜLLER-BÖCKER & KOLLMAIR (2000).

have founded decentralised institutions to administer the various communal duties and reciprocal responsibilities. Furthermore, the peripheral location of the mountain societies, and their resultant political and socio-economic marginalisation, has duly fostered the development of area-specific adjustment mechanisms that ensure subsistence livelihood. As a result, even these days a high level of similarity can be found in the subsistence strategies of mountain communities in different parts of the world (cf. FÜRER-HAIMENDORF 1971; GUILLET 1983; RHOADES 1990; EHLERS 1997 and GRÖTZBACH & STADEL 1997).

There are also many cultural factors and socio-economic interdependencies that favour the multi-level organisational structures and mutual co-operation that ensure collective survival in the inhospitable and uncertain mountain environment. In the prevailing socio-economic system, a single household is unable to carry out independently all the activities necessary to maintain its subsistence livelihood. These labour-intensive activities, comprised of both agriculture and animal husbandry, are commonly known as 'combined mountain agriculture', and most of them require more resources and manpower for their successful operation than a single household can provide. Likewise, seasonal factors, the relatively low productivity of the mountain resource base, and disparities in material-resource ownership among the households in a village also encourage co-operative activities at a community level. Most of the reciprocal activities practised at various levels are concerned with either the traditional economic activities of mixed mountain agriculture or else village-level co-operative maintenance of infrastructures. The duties and responsibilities of each household within the system are clearly defined, and are implemented through locally constituted decentralised institutions.

The importance of the traditional livelihood strategies can be assessed both from the ownership and management of natural resources in the study area (cf. Chap. 3). As is true in other mountainous villages, the inhabitants of Mehlp Valley engage in various activities for their subsistence survival. Here agriculture and animal husbandry were and still are the principal economic activities; although locally manufactured handicrafts were until recently additional minor resources for exchange and barter. These items were produced on a limited scale only, however, mainly to fulfil the households' needs. In most of the mountainous areas, as well as in Odier, the traditional livelihood strategies were not profit oriented, but rather aimed at meeting the households' subsistence needs for a single agriculture year, i.e. until the next harvest (cf. GUILLET 1981: 20). Although contemporary transformations are rapidly causing the old practices to be replaced (cf. Chap. 5), in remote and marginal areas such as Odier, the traditional systems have not yet totally changed. Keeping this fact in mind, in this chapter a detailed account of agriculture activities and animal husbandry with associated practices is presented for Odier Village. This discussion begins with a detailed description of the functioning and organisation of the agricultural system in the village, highlighting seasonal-specific activities.

## **4.2 The Agricultural Calendar and Related Activities**

In mountainous areas, agricultural activities are mostly governed by seasonal cycles. The selection of suitable crops as well as sowing and harvesting times are entirely de-

pendent on micro-scale weather conditions. In Mehlp Valley, the temperature remains well below freezing during the winter, and snow stays on the surface for about four to five months, depending on the intensity of precipitation and the villages' exposure. Villages with southern exposure are free of snow most of the winter, but due to extreme temperatures and frozen ground, no agricultural activity can be carried out. The growing season in the lower part of the valley is about six months long; in the summer settlements lying above 3,200 m, however, it is restricted to less than five months of the year. Therefore, to get a better yield of grain and straw, food crops are sown in both the autumn and spring seasons in all three villages of the valley.

#### 4.2.1 Village Chronometer and Traditional Measures for Accelerating Snowmelt

The spring season starts before the spring equinox, when the days become relatively long and the temperatures high. In Odier, the dates for various agricultural activities are determined according to the position of the sun setting over the western horizon of the village. Every settlement section, based on its location, has its own fixed observation points, from which the villagers mark the signals for beginning agricultural work in both the spring and autumn seasons (cf. SCHOMBERG 1938: 105 and RAHMAT 1996: 217).<sup>108</sup> However, not all households practise this traditional system of calculation to determine the plantation season; rather, most of them simply follow the lead of their neighbours or other experienced persons in the village.

Before starting any cultivation, the winter snow – usually up to one meter deep – must be melted by the sun. The sun's path raises daily higher, as the length of the days increases, but the sun's rays alone are not sufficient to melt the snow because of the high albedo. The local method of accelerating this process is to spread a thin covering of earth over the snow.<sup>109</sup> This is performed around the third week of February in the lower part of the village. Two different methods are followed for the first earth spreading. Either the earth is collected from somewhere and put into a specially designed leather sack (*amkini*) and spread over the snow, or else snow is removed from suitable spots in the fields, and the earth from these plots is then thrown over the snow with the help of a spade. Slowly this process is extended to the upper part of the village, and finally to the summer settlements. In the upper part of the village, as well as in the summer settlements, the snow is not uniformly deep because of drifting, and to free the whole field of snow at one time, earth is spread first over the thickly deposited areas. The earth is usually spread over the snow repeatedly, as subsequent successive snowfalls cover the earth layer and delay the snowmelt. For the many additional applications of earth, soil is brought in from outside, as the surface of the fields has become frozen or thoroughly saturated with melting snow. Manure is also transported to the fields, if this was not already done in the autumn season. Early sowing of barley is considered a main prerequisite for producing a higher yield of grain and straw. These different efforts of

<sup>108</sup> Similar practices have been reported from the Khumbu Valley, Nepal (cf. STEVENS 1993: 133f.).

<sup>109</sup> The same method of accelerating snowmelt and early sowing of spring crops is also practiced in some of the high-altitude villages of the upper Das Kharim Valley, Astor subdivision (own survey), and in Ladakh (OSMASTON, FRAZER & CROOK 1994: 97).

the local people are evidence that they are utilising all possible techniques and methods to sow spring crops as soon as possible. Nevertheless, the spring weather conditions play a major role in disrupting the inhabitants' anticipated plans and routinely cause repeated delays in sowing.

#### 4.2.1.1 Ploughing Equipments/Techniques and Sowing of Barley

After snowmelt, the vulnerable sections of the terraces and fences are repaired to protect the crops from both erratic and controlled grazing animals. Regular sowing of barley starts in the lower part of the village in the first week of March, and lasts until the end of April in the summer settlements. However, some of the south-facing fields are occasionally sown on 27<sup>th</sup> or 28<sup>th</sup> of February. Locally produced seed is predominantly used. This is a special fast-maturing variety, which needs about 120 days to ripen. This variety of barley produces a relatively better yield of grain and straw than other varieties, and the villagers highly appreciate the nutritional value of its straw. To obtain a better harvest, the villagers try their best to sow as early as possible. However, weather conditions during the spring season frequently cause delays in sowing, and this badly affects productivity.

Before ploughing, manure is uniformly spread over the field with the help of iron and wooden shovels. Where barley is to be sown, the seeds are broadcast, and then the field is ploughed only once. The ploughing usually starts at about 10 o' clock in the morning, when the surface frost has melted. The field is ploughed in different directions, according to its slope and shape. The farmer starts in one corner of the field and first ploughs a horizontal area up to two meters in width. Thereafter the bulls are directed to plough a width of two to three meters on both sides of the field to facilitate turning the plough at the edges of the field, and to make sure that no area is left unploughed. At the beginning, others help the ploughman steer the oxen until a few furrows have been successfully ploughed. As the oxen are well trained and respond correctly to the commands, after the initial ploughing there is no need for additional help, and the ploughman can easily carry on the work alone.<sup>110</sup>

While one man is ploughing the field, children and other helpers follow behind the plough, breaking up the big-sized clods with one-sided lightweight hoes. Still others follow behind them, drawing the harrow to make the field surface uniform for irrigation and to bury the seeds. The harrow is pulled in a cross-wise direction to the plough-lines, simultaneously with ploughing. The harrow is usually made of fresh sea-buckthorn or wild-rose shrubs and must be sufficiently heavy to level the ground; if it is not heavy enough, small stones are placed on the harrow to give it additional weight. After the plot has been ploughed and harrowed, the workers bring the plough back and use it to make the watercourses (*phat*) for irrigation. These furrows are either single or

<sup>110</sup> While ploughing, the farmers use three main commands to direct the oxen. These are with reference to the initial furrows, i.e. *pesbat* for coming close to the furrow, *ber* to go away from it, and *geyah ha ha* for returning after the completing of a second furrow. When a young bull is being trained, more helpers are needed, so this is carried out at any convenient time, subject to the availability of manpower and time. Generally, fields that are already levelled and uniform are selected for such training.

double plough-lines, and their number and alignment depend on the micro-slope of the field in relation to the watercourse. To make the irrigation furrows, first the oxen are guided through with the plough to make the main furrows, which are then cleaned out with spades and hoes to facilitate water flow. Then other furrows are made and cleaned out all around the edges of the field, to prevent unwanted water from flowing into the field.

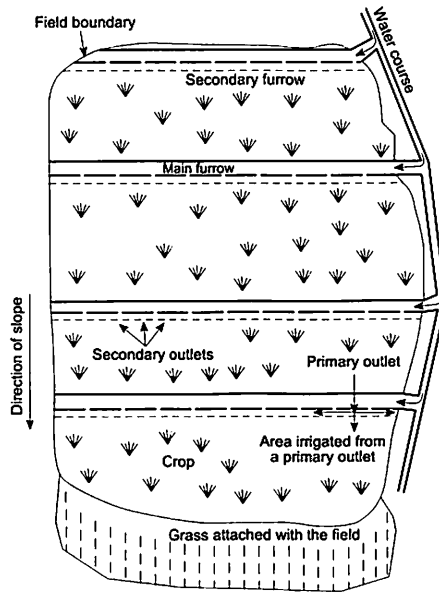
#### 4.2.1.2 Firewood Collection, Irrigation and Sowing of Spring-Season Crops

Due to the utter barrenness of the landscape and the long cold winters (cf. Chap. 2.1), the villagers start collecting firewood from the nearby pastures before ploughing begins, and the collection process continues through the end of April. After the snow melts, the households start cutting firewood from their privately owned plantations in the vicinity of the dwellings. First the willow, poplar and seabuckthorn branches are cut from the stem and roots respectively, and then they are gathered into moderate-sized bundles and stacked on the spot for some time, up to three months. These are then transported to the nearby houses and stored there for use in the winter season.

In the meantime, the annual repair work on the irrigation channels is undertaken. This is a communal work, usually taking a maximum of three consecutive days per channel, and it is compulsory for the shareholder households to participate (cf. Chap. 3.4.4.2 & 4.6.1). After a short pause sowing of spring wheat starts in the lower and upper parts of the village. In the summer settlements spring wheat is usually sown along with barley. In the lower and upper parts of the village, before a field is sown it is irrigated and left for two to three days to become suitable for ploughing. The field should not be too dry or too wet, as both extremes negatively affect seed germination and yield. Depending on the nature of the field and the crop rotation patterns, manure and sometimes chemical fertilisers are also provided.<sup>111</sup>

In Odier, the first irrigation (*pasteġh*) of the cereal crops starts at the beginning of May. This is a time-consuming and laborious work. Water is diverted into the fields through the main furrows, which run from one end of the field to the other. Small diversions (*ghospa*) are made at suitable intervals to divert water into a supplementary or smaller irrigation furrow (*phat*). Then water is carefully and uniformly distributed on both sides of the main diversion, through minor or sub-diversions (*ashkolich*). Upon completion of this section, another diversion is made in the main furrow, until the whole area below the main irrigation furrow is completely irrigated. Small stones and grass sections are cut with a spade and placed on the main diversions to keep the channels open. Some water is also allowed to spill over from the field margins to irrigate the adjacent small grass terraces (*broun*) (Fig. 4.1). In a like manner, water is shifted to other up-slope furrows, until the whole field is completely watered. The water flow is properly controlled, so that it neither makes rills nor uproots the plants. Also, special care is taken during this initial construction of the water channels and distribution of the water, so that there will no longer be any need to walk through the field for the second and successive

<sup>111</sup> More than 70 percent of the chemical fertiliser used in this village is applied for this crop. The fertiliser is especially used in the fields in the summer settlements, which are located far away from the dwellings.



Source: Fazlur-Rahman 2003

Source Draft and drawing, Fazlur-Rahman 2003

**Fig. 4.1 Method of Field Irrigation in Odier**

watering. Subsequent irrigations use either the uppermost irrigation furrows directly, or else water is diverted into the individual furrows. This depends on the first watering pattern or the availability of irrigation water for the particular field.

Maize and potato are sown and the long fallow is ploughed simultaneously around mid May. In sowing maize, similar to spring wheat, the field is irrigated and ploughed twice. Potatoes are planted in a linear pattern, and after the second ploughing, furrows are made successively at suitable intervals. Most of the family members participate in planting the potatoes, placing the seeds along the furrows in such a way that the eyes are always pointing upwards. The seeds are then covered with soft earth with the help of a hoe, and the furrows are cleared for the smooth flow of water. Sufficient space is left between the consecutive furrows. Around mid July when the plants start flowering, the furrows are further softened with hoes. This second hoeing has two advantages for increasing the productivity of the potato crop. First, the loose ground gives the roots a better chance to spread and bear more potatoes; and second, it also clears unwanted weeds from the potato furrows, thus restricting nutrient supply to the single plant – potato.

Except for ploughing, the women carry out all the other work associated with kitchen gardening. In this case, some vegetables are also sown with potato in small patches ranging from one to two square meters (cf. Chap. 5.2.3). Most of the kitchen gardens are in the lower and upper parts of the village and, due to seasonal shifting to the summer settlements (cf. Chap. 4.5), they remain largely untended during the summer. In the past, wild plants were the main source of fresh vegetables in this village. They were collected and eaten fresh, and every household also dried a substantial quantity for the

winter season. With the new availability of sufficient food in this village (cf. Chap. 5.2.4), the consumption this practice has been totally abandoned by the inhabitants.

#### 4.2.1.3 Spring Season Milling and Extensive Afforestation Activities

Grain is milled for the summer season in May, before the snowmelt increases the stream's discharge. During spring-season milling, it usually takes two to three days to grind enough flour to supply a household of eight members for three to four months. As the days are long enough in this season, grinding is done during the days. The flour is immediately transported to the summer settlements on human back, although the villagers also occasionally borrow donkeys for this purpose.

In response to the treeless nature of the area (cf. Chap. 2.1.3), during this season all households also carry out a very intensive and regular afforestation and plantation programme. As in other villages in the Northern Areas of Pakistan and Chitral, different tree species are planted to fulfil the Odier villagers' needs for fuel and fodder (cf. MASSODuL MULK 1991, 1992; HUSAIN 1992; GOHAR 1994; NÜSSER 1999, 2001 and STÖBER 2001). These include two varieties of poplar and four different varieties of willow. These are planted both in linear and compact forms (see below). New furrows are made for the plantation of willow and seabuckthorn. These furrows are usually arranged in such a way that all the rootstocks can easily be irrigated from a single water intake.

For the plantation of willow, the villagers separate out suitable branches during the firewood-collecting process and cut them into approximately 50-centimetre-long sticks, which are then half buried in the ground along the furrows. Young seabuckthorn plants are uprooted from already existing plantations and replanted along the furrow or in other suitable sites. Although there is no free-grazing in the village, the seabuckthorn plants also serve to protect all other plants from animal encroachments. Poplar and willow are also planted in lines along paths, irrigation channels or field boundaries. For this purpose, long, straight sticks, three to five centimetres in diameter, are directly planted in 30-centimetre-deep holes. Fruit trees such as apricot, apple, walnut and mulberry are also planted close to the dwellings, and therefore need extra protection from animals. The survival rate of all these plants is quite satisfactory, and in case of failure, the dead plants are added directly to the winter fuel stock.

In addition to propagation through regular plantation, some of these plants have inherent traits of self-multiplication. After their principal stems are cut, many offshoots grow from the roots. This is commonly seen in seabuckthorn (*mirghniz*), *Salix himalayensis* (*shatelik*) and *Populus pamirica* (*romeno*). *Populus nigra* (*terik*) has the same characteristic: after cutting the mature tree, subsidiary growth takes place from the roots. Only *Salix tetrasperma* (*khan telik*) always needs new plantation. Except for *Salix denticulata*, *Salix karelinni* (*chikarlispiteli*), which has been newly introduced in the summer settlements from the neighbouring high-altitude villages, most of these plants have a long life span; however, their growth is very slow, due to the short vegetation period (cf. Chap. 2.1.3).

## 4.2.2 Summer Season: Repair and Construction of Settlement Ensembles

At the beginning of the summer season, the workload is relatively light. The growing crops need only occasional irrigation, which is easy compared to the workload during the spring season. Therefore, most new house construction and repair work demanding more labour input is carried out in early summer, mostly in June and early July. Around mid July, the households' workload increases to a maximum, and it becomes quite difficult to find non-reciprocal labour assistance (*yardoyou*) for construction. At the beginning of this season, most households usually occupy their summer settlements (cf. Chap. 4.5.1) and pay regular visits to their fields in the winter settlements for irrigation and other farming activities.

The rare monsoon rains that penetrate to these remote valleys during the peak periods in mid July and mid August occasionally disrupt the on-going farming activities. This torrential rain not only disturbs the harvesting of crops, but also damages important village infrastructures, such as irrigation channels and roads, which then need immediate repair. Summer season is crucial for harvesting, gathering and storage of crops. Therefore, all the household members, irrespective of their age and sex, are busy performing their respective activities (cf. Tab. 4.5). Delay in the harvest of some of the crops causes many problems. For instance, if barley is not harvested in time, the ears fall off. Likewise, a delay in cutting the lucerne causes it to lose its productivity, as the small branches dry out and fall off. The wheat harvest, however, can be delayed to the maximum extent without any problem.

As a traditional practice throughout the whole district (cf. ISRAR-UD-DIN 1965: 137), no intensive weeding is carried out for any crops, except maize and potato. Males or females perform this task, depending on the location of the fields and intensity of work. Maize is always sown very thickly, and the weeds are used as a fresh fodder for milk cows. In the case of other crops, weeds (if any) are left growing and are usually separated out at the time of harvest and stored together with other fodder and crop residues for winter-feeding (cf. Chap. 4.3.2.8).<sup>112</sup> As an additional fodder source, they are considered as important as grain or straw.

During the whole summer season, the men and boys regularly visit the high pastures to collect dried dung, which is used as fuel for cooking. Meanwhile, milk processing (cf. Chap. 4.3.3.1) is also at its peak in the village, and most of the females are busy with that, along with other domestic and outdoor activities. Time is too short to process wool, with the women only occasionally carding while grazing the milk cows in the vicinity of the dwellings (cf. Chap. 4.3.3.2).

### 4.2.2.1 Techniques and Organisation of Crop and Grass Harvest

The harvesting and gathering of agricultural products comprises the second peak of the summer-season work period. Although the male members of the households do all the

<sup>112</sup> In Odier, except for a very few cases, weeding is not so rigorously carried out as has been reported from other areas, e.g., Karakoram and the Himalayas: (HEWITT 1989; STEVENS 1993; MILLS 1996 and AZHAR-HEWITT 1998).



work, the females are also kept busy providing food to the workers in the far-off fields; they also help with making sheaves or separating out weeds.<sup>113</sup> Before the beginning of the regular harvesting season, most households usually visit the local smiths to repair and sharpen the locally made sickles.<sup>114</sup> The final watering (*amunek*) of the crops is done at least one or two weeks before the harvest. The farmer makes this decision very easily by examining the crops. Following this, all the main diversions from the irrigation furrow, as well as from the channel leading to it, are carefully closed, to stop undesirable water-flow into the field.

Contrary to the general practices in Zangskar where barley and wheat crops are irrigated before harvest (cf. OSMASTON, FRANZER & CROOK 1994: 105), in Odier cutting begins when the ground has become hard and dry enough to resist uprooting the plants. The importance of crop residue as a principal winter fodder can be assessed from the fact that all crops are cut with sharp sickles at the lowest possible point on the stem, to increase the straw volume. The harvesting season begins around mid July in the lower part of the village. Barley and lucerne are cut simultaneously. The harvesters do most of the work in a squatting position, and they usually wear a partially processed goat- or sheepskin as an apron. The crops are cut by gathering the stems into handfuls. If the plants are uprooted, the clods are cleared away from the roots with the back of the sickle. Then the handfuls of crop are arranged in a line. These handfuls of food crop are collected immediately and made into sheaves, to avoid post-harvest damages. Barley sheaves are left on the field in bundles of twos and threes for three to four weeks, during which time the bundles are turned two or three times. The sheaves of wheat are also left on the field for one or two days, and are thereafter gathered together at suitable spots in the field and placed together in an upright position (*chongo*), with the ears always facing up. This is done mainly to avoid depredation by animals and to facilitate making loads when the crop is transported to the threshing floors.

In Odier, the wheat harvest is followed by grass cutting. For this purpose, the villagers usually arrange non-reciprocal labour, depending on the available workforce. The grass and other fodder crops are cut, and the handfuls are left on the spot for two or more days to dry. Sheaves are made in the early hours of the day. Lucerne sheaves are counted and immediately shifted to the terraces or other safe areas. Then the fields are irrigated as soon as possible, to enable a second cutting. The amount of lucerne to be donated to the needy as *zakat* (every tenth sheaf) is determined and the needy households are informed.<sup>115</sup>

<sup>113</sup> As in other areas (cf. HEWITT 1989: 339), this is the main contribution of the Odier household women during the harvesting season.

<sup>114</sup> Generally a household keeps four different varieties of sickles: one for *moshin* harvesting, one for general crop, another for grass, and yet another for cutting willow and poplar branches. All these sickles vary in size and weight; those for cutting grass are particularly sharp, light-weight and small in size.

<sup>115</sup> *Zakat* is actually the tithe (locally called *ushur*) that the households pay on their land produce. In this case, the tithe is paid on the fodder crop (lucerne only) and not on the irrigated grass and forest resources. Every 10<sup>th</sup> bundle of lucerne is set aside from the total production as *zakat*.

They can then collect their respective shares (number of sheaves) of lucerne at their own convenience. All the grass bundles are then shifted to the roofs of the winter houses and made there into stacks for winter-season stall-feeding.

At the same time (around the first week of August), haymaking in the communally owned and seasonally reserved pastures (cf. Chap. 3.4.4.1) also begins. The individual households carry out this activity; no help or assistance of any kind is extended between relatives and neighbours. After cutting, the households assemble their handfuls of fodder together into rough bundles (*phurusk*) and place small stones on top of them to save the *phurusk* from being blown away by the wind. The various fodder plants are still green and heavy; therefore the bundles are left on the field for two to three weeks to dry out and lose weight. Only a small amount of fodder is transported down to the house at the end of every working day from the pasture. In this regard, all the households trust each other, and no theft of collected fodder has ever been reported in this village. The remaining bundles are transported at some later time, to the individual households' convenience. For this purpose many round trips are made between the house and the pasture. Sometimes, depending on the situation, the harvested fodder is first transported to the nearby summerhouses and later on shifted to the winter houses.

In the meantime, *moshin* from the pasture areas is also harvested (cf. Chap. 3.4.3.2). This is a relatively difficult and laborious task and usually non-reciprocal labour is required for this work. *Moshin* requires a special sickle, and the cutting and bundle-making techniques are also different from other kinds of fodder. The juice of this plant temporarily burns the skin when touched; therefore special arrangements have to be made to avoid this problem. *Moshin* plants are usually distributed over a larger area and the stems are up to one meter tall – and therefore, cutting is done either in standing or kneeling.

*Moshin* is harvested in July/August and usually the handfuls are held under the arm (*kushk*) and then again cut or folded into suitable sizes for making sheaves (*moshin bau*). These bundles are formed loosely without any supporting material; usually small stones are placed on top of the bundles to protect them from wind. After one week or so, these small sheaves became compact and dry. In the second step, the sheaves are collected together at suitable sites in a form of small stacks (*bareshul*) containing 12 to 15 sheaves each – normally equal to one load carried by a man on his back. For this activity once again help of others is needed as the sheaves are randomly distributed over the whole *moshin* area. This is done to facilitate load making and time saving, while transporting it down to the village. In case of any anticipated damage by free grazing animals, the owner regularly guard it till its transportation. Usually neighbours and relatives are requested once or twice depending on the number of loads and availability of helping person (*yardooyu*) for taking it down to the house. It is also stacked on the roof of the stable for winterfeeding.

The waterlogged types of grasses (*toq*) (cf. Map 3.3) are always harvested as the last of this sequence during the summer season. This is relatively hard work, as the ground is always wet, and it requires special harvesting skills. Usually additional labour force is recruited for this purpose through the *yardooyi* system. Relatives and neighbours are requested to help out, and specially designed, very sharp sickles are used for harvesting.

Each household knows the size of its *toq* grass area, as well as the number of persons needed to cut it. If it is possible to arrange for enough helpers, the work is done in one day; otherwise only half the required number of labourers is requested and the work is completed in two spells. The households with more area under this type of grass make a special appointment with the village blacksmith to sharpen the grass sickles. The harvesters usually squat in a line and move downhill while they cut, staying cheerful in this difficult work by competing with each other. Each harvester places his handfuls behind him in a regularly arranged line to facilitate sheaf making. Bundles are made in the same way as lucerne.

A special variety of artemisia (*Artemisia persica*) is found in the lower pasture of the village, below 2,800 m a.s.l. It is substantially tall, growing up to 50-60 centimetres in height. Young boys and girls collect it from the pasture, and then it is stored for the whole year. A handful of this plant is taken to make brooms for cleaning the house. This is the only use of this plant, which has a very strong odour and bitter taste, and is therefore not used on the threshing floor.

#### 4.2.2.2 Repair of Threshing Floors and other Threshing Arrangements

Each settlement section or neighbourhood has many threshing floors. Some are owned by individual households, and others are shared by many households of the neighbourhood. Generally a threshing floor is circular in shape, with a diameter of five to seven meters. It is carefully constructed with regard to the wind direction, occasionally very close to the straw storehouse. The edges of the threshing floor are raised about 30 centimetres, to prevent the spill-over of chaff and grain. After the harvest is completed, first the threshing floor is improved. Water is diverted into it for a whole night and the surface is then further softened with the help of spades and hoes. Sometimes fresh earth is also added to it. The children are then allowed to make the mortar smooth and uniform by trampling on it, and the resultant thick mortar is evenly spread over the whole area with the help of a levelling instrument. Coarse chaff is thrown on top of the mortar, and then the edges are repaired, if necessary. Depending on the thickness of the mortar, it takes up to a week to dry. During this period the floor is regularly beaten to minimise cracking. Sometimes a veranda-type structure (*lawar*) is attached to the threshing floor. This structure has three walls and a permanent roof, with an open front facing towards the threshing floor. This building is also cleaned and properly repaired annually.

When the threshing floor has become hard and dry, all the harvested crops in turn are brought and assembled there, preparatory to making stacks. Then the stacks are made very close to the threshing floor, always keeping the wind direction in mind. The stacks are more or less conical in shape, with a broad base. The sheaves are arranged with the ears towards the centre. The height of these stacks depends on the number of sheaves of that particular crop. When there is a *lawar*, all the sheaves are stored inside of it, in different sections.

There are three different reasons for making stacks and storing the sheaves inside a *lawar*. First of all, collecting the sheaves from the distant fields minimises post-harvest damage by animals, birds and human beings. Secondly, the sheaves are very close to the threshing floor and are readily available for threshing. Otherwise the bundles have to

be transported to the threshing floor for every threshing spell, which takes a lot of time. The third obvious reason for collecting the sheaves is to protect them from unwanted rainfall and keep them ready for threshing. In case of rainfall, the top of the any unprotected stacks must be covered with tarpaulins or sheets of some other waterproof material.

Post-harvest damage to the crops is generally minimal, except in cases of torrential rainfall. No animals are grazed close to the harvested fields, and only chickens cause regular damage. They are usually collectively restrained inside the houses for approximately a fortnight during this season. Another obvious difficulty is the potential loss of ears of grain while transporting the sheaves from the fields to the threshing floors; some might fall out on the site where the loads are made, as well as on the way. To minimise this damage, the sheaves are carried in the early hours of the day, before the overnight dew has dried out. Secondly a thick cloth of suitable size is also spread out on the field, and bundles are made into loads on top of it. Additionally, the women glean all the ears left on the field very carefully, as well as the whole length of the way to the threshing floor. Thirdly, the threshing floor is cleaned before the stacks are made and the transported loads of sheaves are put there. Thus, the whole post-harvest process of transportation and stack making is carried out without any significant damage to the crop.

When most of the harvested crops have been gathered and stacked, other preparations for threshing begin. Usually men go to the nearby birch groves and cut branches to make large-sized brooms. This is done with some secrecy, since most of the nearby woods do not belong to the village.<sup>116</sup> Small brooms of *Artemisia chitralensis* are also made ready to clean and manage the grain. Meanwhile, the other necessary implements, such as a wooden fork, shovel and large-sized sieves, are also repaired and arranged. All the non-lactating cattle except for yaks are brought down from the high pastures. Before threshing, the threshing floor is plastered with thick dung to keep it clear of dust and to fill the small crevices. After the threshing floor has dried, the crop is piled up about half a meter deep all over the threshing floor, leaving only some space at the edges. Then, depending on the radius of the threshing floor and the availability of animals, a minimum of three and a maximum of seven or nine animals are tied closely together abreast and driven around and around the floor. One donkey or ox is always trained to work as a pivot (*mer*),<sup>117</sup> and a rope is usually tied around the noses of all the animals to keep them in line and prevent them from eating the grain. The *mer* controls the rotating movement of the whole threshing team. Members of the family take turns walking behind and driving the cattle, and usually this driver holds a bowl to catch the animal droppings before they can mix with the straw and grain. During threshing, the crop pile is turned over with the help of wooden forks, two or three times. This reversal

<sup>116</sup> There are three small patches of birch and willow groves in the vicinity of the village. The nearest one belongs to a few households from Rayeen Village (cf. Chap. 3.4.6.1 & Map 3.5). Of the remaining two patches, one belongs to the village community, and two households of the Shaipay clan own the other (cf. Chap. 3.4.5).

<sup>117</sup> This is in contrast to the practice in the Karakoram and Himalayas, where a pole is inserted in the middle of the threshing floor (personal experience in Astor Valley). For more details, see HEWITT (1989: 346), OSMASTON, FRAZER & CROOK (1994: 106) and MÜLLER-BÖKER (1999: 115).

keeps the threshing process uniform. The large brooms are used to control the chaff from spreading. The duration of threshing depends both on the number and type of threshing-team animals, as well as the crop threshed. On the average, barley takes up two hours, and wheat, up to three-and-a-half hours.

After two to three hours, the straw has been broken into small pieces a few centimetres long, and the grains have all come loose from the ears. The cattle are then let free for grazing and watering. The chaff and grain are piled together in the lower part of the threshing floor, ready for winnowing. Now everything entirely depends on the consistency and strength of the wind. First wooden forks are used for winnowing, and the long broom for collecting everything back together in the centre; later on, when only the fine chaff is left with the grain, the same process is repeated with a wooden shovel. Now the small broom is used to collect the grain and remove the remaining chaff from it. After the chaff and dust have been removed, the grain is passed through a wooden sieve especially designed for each grain. Finally the grain is put into goat- or sheepskin sacks to be taken to the houses. The weight or number of sacks is first carefully counted at the threshing floor for the purpose of calculating the *zakat* payment, before the sacks are removed to the houses. The chaff and straw are put into big sacks, transported to the household roofs and tipped through the hole into the household fodder store. Immediately after removing one load of grain from the threshing floor, arrangements are made for the next threshing, and sometimes up to three threshings are completed in one day. Threshing usually starts in the morning at 9:30 or 10:00 o'clock, and the last threshing is preferably finished late in the evening. Winnowing is done early in the morning.

While threshing, some wheat sheaves are cleared of grain by hand to fulfil domestic and communal needs. This is done exclusively by men. The resultant long sheaves are used for various purposes. One or two such sheaves are contributed to the neighbourhood mosques to be spread below the rugs and carpets (cf. Chap. 4.6.3.2); others in the guestrooms. This long straw, together with coarse chaff, is also used to make special types of bedding for winter use in the living room. It is also used as a building material to hold the mortar above all the wooden structures. Every year this long wheat straw is needed for these purposes; therefore, all the households make some sheaves for their domestic use. In the case of an emergency, these straw sheaves are borrowed from the neighbours or from the mosque, and are replaced at the end of the season.

The prescribed amounts of *zakat* from all crops except lucerne are paid to needy persons directly from the threshing floor, before storage. For storage, some of the grain is kept in sacks, but most of it is stored in the square-shaped bins (*kash*) erected at three or four locations in the single-room house (cf. Fig. 3.9). These bins are dry and safe for storage, but vulnerable to rats. Therefore, a proper check is kept on the bins inside the house. As the grain is not yet totally clean and suitable for milling, the women first pass the grain through small sieves and then clean away all the remaining impurities, such as small stones, etc., by hand. In rare cases, when there is no possibility of cleaning the grain in this way, it is thoroughly washed and dried before storage and milling. Cleaning the grain from impurities is mostly done during milling time with the help of neighbours and relatives.

The maize crop is harvested around mid September and transported to the roof of the house. Maize cobs are separated and left on the roof for drying for two to three weeks. The straw is stored with other fodder collected during the summer season. To remove the maize kernels, the cobs are beaten with wooden sticks. With greater amounts of maize, this takes place either on the threshing floor or in another space away from the house; otherwise, if there is only a small amount, the cobs are assembled in one of the sleeping places inside the house (*nakh*) and beaten there. The grain is again taken either to the roof or the threshing floor for winnowing and cleaning before it is stored in the house for consumption.

Potatoes are harvested at the same time as maize. This is done either by ploughing the whole potato field or using a hoe to loosen the potato furrows, one by one. Children and women usually collect the potatoes, which are then transported to the house and measured for the payment of *zakat* before storage. To minimise damage from the extreme winter temperatures, the potatoes are either stored in specially constructed underground pits (*sayteny*) or in the traditional storage bins inside the house. Contrary to the practices in Khumbu region (cf. STEVENS 1993: 140), these *sayteny* are dug inside the houses, either under the sleeping place (*nakh*) or in the storage room attached to the house (*gonj*). In both cases a thin layer of chaff (up to 10 centimetres deep) is spread first on the ground and then again on top of the potatoes, and then the pit or opening of the storage-bin is permanently closed. Some potatoes are kept for daily consumption in sacks or boxes. According to the domestic needs, consumption from this winter storage begins around mid-winter.

### **4.2.3 Declining Agricultural Workload and end of the Cropping Season**

When the threshing and gathering season comes to an end in all parts of the village and the products have been properly stored in their respective locations in and outside the house, the workload of the household members starts decreasing, day-by-day. Now, most of the households are already occupying their winter houses and very few remain in the summer settlements. In the permanent settlements, special care is taken in storing the fodder, and the storehouse openings are permanently closed. Necessary building repairs are done and all the roof gutters are placed in their proper positions. The livestock is still being grazed outdoors on tree leaves, grass and harvested fields. This continues until either the first snow or the depletion of forage, whichever occurs earlier. Around mid November, most of the livestock except for goats and yaks are housed, and regular ration feeding is practised for the different animal species (cf. Chap. 4.3.2.8).

#### **4.2.3.1 Sowing of Winter Wheat and Milling of Grain**

Winter wheat is sown in the autumn season, starting from the 15<sup>th</sup> of September. The fields are irrigated and ploughed twice, occasionally without supplying additional manure. This is normally the case when proper crop rotation is followed, i.e. one year of barley followed by current fallow and winter wheat. Firewood is also collected from the private plantations as well as from the communally owned pastures (cf. Chap. 3.4.5). This fuel is transported to the winter houses and either stored inside the house or sta-

cked outside of it.<sup>118</sup> Baskets for storing wool/hair and transporting manure are also made during this season. The animal sheds are cleaned and manure is transported to the fields and dumped there in a single pile.

The most important activity of the autumn season is the milling of grain. This is done in an orderly fashion in the watermills of the respective clans (cf. Chap. 4.6.4.1). The main grinding season starts just after the completion of threshing in the late autumn, and lasts up to the end of December, before the temperature drops below the freezing point. This grinding for the winter season is called *peshun*. At this time the watermills are occupied by the households for a relatively long time, ranging from two to ten days, depending on the amount of food to be stocked for the whole family. Each household takes its turn grinding, and no particular system is has ever been followed or devised. The watermill co-owners manage the whole system on their own, with each household transporting initially a token amount of grain down to the mill and leaving it there, as a marker for their upcoming turn (*gan*). Extra help is then needed to transport both the bulk of the grain to the watermill and the flour back to the houses. During the grinding season, the watermill usually needs continuous, full-time vigilant supervision. To ensure smooth functioning, one person stays permanently in the mill. Before the grinding period, a thorough overhaul of the watermill is always carried out to enhance its grinding capacity. For this purpose, an expert is called in to assist. Both the upper and lower millstones are coarsened a bit with iron hammers, and the angle of the turbine is also checked and properly adjusted. Barley is milled first, and takes a relatively long time; this is followed by wheat and other minor crops. The flour is transported to the houses and stored in the respective bins for the whole winter season. At home, the women usually take care of the storage.

As the daily workload lessens with the decreasing temperature, more time is given to domestic handicrafts. The women sew, embroider and perform other needlework, making caps and forehead covers. The initial preparation of woollen cloths, quilts and other products for the forthcoming winter is also started in this season. Woollen socks, pullovers and leather shoes are made or repaired according to the domestic needs. Leatherwork is also initiated for making gloves and sacks.

#### **4.2.4 Limited Outdoor Activities and More Time for Domestic Handicrafts**

In the beginning of January most of the outdoor activities associated with farming have ceased, except for the grazing of goats and yaks. Most of the work carried out during this season is not very arduous, except for that of the women in a few settlement sections who have to fetch water from a long distance. The main activities are the processing of wool and hair, by women and men respectively. The traditional coarse rugs from goat- and yak-hair are also manufactured during this season.

<sup>118</sup> A few households have constructed special rooms for the storage of fuel wood, but it is never stacked on the rooftops, as is practised in Sha-de Village of Zangskar (OSTMASTON & CROOK 1994: 254). In Odier, as well as in other parts of Chitral and Kohistan (cf. SCHOMBERG 1938; BARTH 1956a AND HASERODT 1989a), roofs are exclusively reserved for fodder storage.

The main activities of the womenfolk are the carding and spinning of wool, along with all other household responsibilities (cf. Chap. 4.3.3.2 & 4.3.3.3).

The diurnal temperature range is very high, and on sunny days it remains quite warm outside in the sun. The minimum sunshine duration in the village is about five hours in December and January. Most of the household members remain outside the house during the daylight, sitting on verandas and close to the walls that have the best exposure to the sun. Heating inside the house is restricted to cooking food, usually three times a day, with some exceptional fires made for visitors. Nevertheless, the one-room house (cf. Fig. 3.9) is full of smoke most of the time. During the extreme cold spells in winter, all the roof openings are closed and thick cloths are hung over the doors for the whole night, to keep the house and the animal sheds warm. The smoke hole (*komal*) of the house is also closed in the evening when there is no more smoke left coming out of the fireplace. It is very difficult to keep the house warm, both because it is too big, and because the household members are uninterruptedly going in and out for various pursuits during the whole day. Guests and visitors from outside the village are entertained in a separate guestroom. This is a relatively small room with an entirely different design and layout (cf. Chap. 3). It is much easier to keep warm than the traditional house.

Following every snowfall, the footpaths leading to the nearby spring and the fodder stacks on the roof are cleared, as well as the seating place in front of the house and the outdoor animal-tethering areas. A small portion of a field (current fallow) is also cleared of snow and used as an outdoor toilet. Generally, there is not too much winter snow – a maximum of up to one meter thick – and it is very light compared to the weight-carrying capacity of the built-up structures. Therefore, snow is not removed from the roofs until mid February, when the snow begins to melt and thus become much heavier. In any case, the general perception among the people is that removing snow from the roofs before February makes them susceptible to frost. Removal of winter snow from the roofs thus begins around mid February in the lower part of the village, followed by the upper part. In the summer settlement the villagers remove the snow from the roofs in the month of March, at the same time that they have gone up there to spread earth over the snow on the fields (*amkik*). For deep snow, a wooden shovel bigger than the one used in threshing floor is used. Otherwise small amounts of snow are removed with the help of a birch broom. Occasionally both implements are used together. After the first removal of snow from the roofs, this process is repeated following every successive snowfall. Around the third week of March, close to the spring equinox, this removal of snow from the roofs becomes a daily routine, although the animal passageways, paths, etc. are left to melt by themselves.

As is clear from the above discussion, there is a very close relationship between agriculture and animal husbandry in Mehlp Valley. The agriculture provides straw and fodder for the livestock, and manure as well as draught power is contributed in return from the animal husbandry. The inhabitants have always been heavily dependent on both activities to ensure their subsistence livelihood strategies in an uncertain environment. Although there have been many changes in the inhabitants' socio-economic structures, animal husbandry still plays a significant role in the socio-cultural life and subsistence sustenance of the Odier villagers. The following discussion focuses on the



main characteristics of the traditional local livestock husbandry and associated communal activities and organisations in the village.

### 4.3 Economic Significance and Salient Features of Animal Husbandry

Traditionally, animal husbandry has been a very important economic activity in Mehlp Valley. First of all, in the past it was the only possible long-term investment to ensure security of sustenance in the harsh environment, where the local rulers exclusively owned all the land and other resources (cf. Chap. 2.2). Secondly, the productivity of and entitlement to arable land was closely connected with animal husbandry, e.g., the annual sheep tax (*thangi*) on arable land was in practice for a very long time in the former state of Chitral (GENERAL STAFF INDIA 1928; SCHOMBERG 1938; BARTH, 1956a; STALEY 1969; BAIG 1990 and EGGERT 1990), and livestock were the only sources of draught power and manure. According to the historical sources, during the local rule 800 sheep, 8 yaks, 20 horses and 400 *bati* [ca. 1,000 kg] of *ghi* (purified butter) were collected from Torkhow tahsil in a single year.<sup>119</sup> Moreover, animals were the only available means of exchange and barter in the total absence of money in the former state. Today, animal husbandry is still very important in economic terms; however, with the passage of time, other sources of income and investment have become more attractive for the villagers. For example, in the local market a four-year-old yak costs about Rs. 10,000 and a cow about Rs. 6,000.<sup>120</sup> In comparison, the total earnings of a seasonal labourer hardly exceeds Rs. 5,000 for the whole winter season, from November till the end of March. This means that the sale of a single yak per annum is more lucrative than five months of wage labour. In spite of that, and among others, nowadays the allure of living in the cities and other socio-cultural factors in the changing socio-economic environment are causing a substantial decrease in the practice of market-oriented animal husbandry in the village.

Nevertheless, with animal husbandry remaining the second important pillar of the traditional subsistence economy, all the households in Odier still keep at least a few head of various species of livestock for their domestic needs. This practice is very closely integrated into the economic system of the combined mountain agriculture. The animals contribute food to the family, raw material for domestic handicrafts, and manure for the fields. Even nowadays, livestock are the main items of exchange among the households and between relatives in the village. Animals also serve as an investment for emergency situations, and can be easily converted into money at any time.

In Odier, similar to the situation in Yasin valley (cf. HERBERS 2000a), meat, milk and other dairy products still play an important role in the socio-economic and cultural spheres of the inhabitants. Although these products are mostly imported into the Northern Areas and Chitral from the lowlands (ALLAN 1989: 138; HASERODT 1989a: 122 and KREUTZMANN 1993b: 30, 1995a: 220), they are not generally available in the markets of such remote villages as Odier. Their availability is usually restricted to the

<sup>119</sup> IOR/2/1077/235/11826/214-213. This document, under the heading of 'revenue', provides a detailed account of tax realisation by area.

<sup>120</sup> See HASERODT (1989a: 124) for comparative prices in the 1980s.

relatively more accessible settlements and the regional headquarters, where they command higher prices, and are thus unaffordable for the majority of villagers. Therefore the households keep a few animals to ensure the availability of the above-mentioned products.

The unavailability of these products in the market is one of the main factors behind the overall increase of livestock in the Northern Areas and Chitral (STREEFLAND, KHAN & LIESHOUT 1995: 91; CLEMENS & NÜSSER 2000: 162 and HOLDSCHLAG 2000). The recent drought conditions in the whole Hindu Kush region had a negative effect on the overall animal husbandry system. The decrease in the fertility and forage yield of the pastures and grazing grounds, both for seasonal grazing and haymaking, caused a high-stress situation, and animal productivity was greatly reduced, especially throughout the whole Mulkhov tahsil. In 2001 most of the households were forced to sell their cattle for a very low price. The animals were too lean to be suitable for butchering, and furthermore, due their undernourished condition, it was difficult to drive them for long distances.

#### **4.3.1 Herd Size and Composition**

A household's herd is normally composed of three to four different animal species. This diversity in animal species is one of the mountain farmers' basic strategies that ensure their subsistence livelihood by utilising all the available natural resources. The total number of species depends on several factors. These include the household's capacity for winter-feeding, general pasture characteristics, the economic utility of the animals, and the availability of suitable labour force in the household (cf. STALEY 1969; SAUNDERS 1983; BISHOP 1990: 243; SHARMA & JODHA 1992; MACDONALD 1998; EHLERS 2000a; KREUTZMANN 2000a and SCHMIDT 2000a). The feed type, and composition and amount of fodder consumed vary according to species, as do the time and labour required for tending the animals. For example, cows need more feed throughout the year than oxen, as the latter are sent to the alpine pastures for free grazing for more than three months (cf. Fig. 4.3). In the case of goats and sheep, the former needs relatively less fodder in the winter season, but more labour compared to the latter. Due to the nature of the breed as well as their feed preference (cf. EHLERS 2000a: 83), the goats cannot be kept and grazed at home with the milk cows and other animals.

In Odier, as is common in the whole Northern Areas, herd size directly depends on two factors: landholding size and availability of suitable labour force. These are both important conditions affecting the provision of winter fodder, seasonal haymaking, rotational-based turn grazing, and tending requirements. A household with more land can obviously spare more area for fodder crops, while still maintaining more irrigated grass and plantations for daily grazing in both the spring and summer seasons, as well as for winter stocks. The household can simultaneously grow more food crops and harvest a sufficient amount of straw from the food crop residues for winter-season stall-feeding. This availability of fodder and food-crop straw is favourable for the cattle, providing their main feed. On the other hand, the most suitable fodder for sheep and goats is that which is collected from the communal pastures during the annual haymaking. In this case, the amount of fodder a household collects is directly proportional to the size of

the available male labour force in the house. The seasonal availability of labour force is one of the determinant factors not only for fodder collection, but also for daily tending of sheep, goats and yaks. In Odier, the animal husbandry is organised in such a way that the availability of male-labour force during the winter season is one of the most crucial factors.<sup>121</sup>

An additional important precondition for keeping yaks is to own cultivated land in the summer settlement (Romolasht), in order to provide winter fodder. The village's yak herd was traditionally tended in Romolasht (cf. Chap. 4.3.2.6), since the principal clans of Odier – i.e. Somalay, Shaipay and Bulay – owned land there (cf. Chap. 3.2.1). Therefore, only a few households of these clans were rearing yaks till the recent past (cf. Chap. 5.3.1).

To highlight the interdependent relationship between herd size and arable land occupancy/ownership and household labour force, the available data can be further analysed by using livestock units.<sup>122</sup> There are certain unavoidable constraints in ascertaining the total arable-land occupancy/ownership of a household, since 27 percent of the total village area is exclusively given to fodder, grass and plantations (cf. Fig. 3.8), and this area cannot be divided among the respective owners/household (cf. Chap. 1.4.2). Moreover, the traditional division of labour along gender lines (cf. Tab. 4.5 and Fig. 4.7) also plays a decisive role in the allocation of animal husbandry duties among the available labour force at the household level.<sup>123</sup> Nevertheless, despite these constraints, household livestock ownership and its connection with the respective variables (cultivated land occupancy and household size) show a persuasive relationship. In both cases, with few exceptions, most of the values are concentrated around the mean (Fig. 4.2a & b).

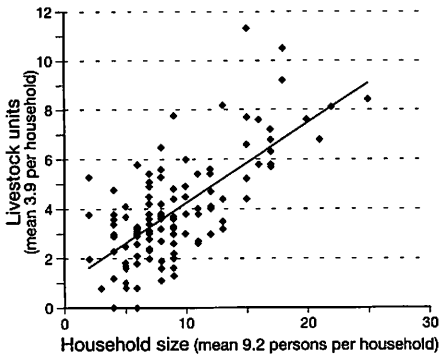
Up until the recent past, the rotational grazing of sheep and goats was conducted through reciprocal exchange of household labour (*hoyou*) and conventional helpers on request (*yardooyee*) (cf. Chap. 4.6.1). All members of a household (male, female and children) participated in the animal husbandry and regularly contributed their share of work. The women and children performed the daily activities associated with animal husbandry, with the women contributing more than the children. The male household

<sup>121</sup> The seasonal availability or shortage of male labour force depends on the access to off-farm job opportunities close to the dwellings. The more accessible localities in the northern mountainous belt usually attract seasonal tourists, who provide a source of cash income for those who live nearby. In contrast, the relatively remote and marginal areas have almost no tourism-related activities; thus there are no extra sources of cash income close to the villages. Therefore, the inhabitants of the remote villages participate in the seasonal out-migration to the lowland urban centres on a relatively large scale, and are not available to help out with the winter-season activities (cf. Chap. 5.5.2.2). For comparison with other areas having more tourism opportunities, see KREUTZMANN (1993b, 1996a, 2000a) and Ehlers & KREUTZMANN (2000b).

<sup>122</sup> The values for the calculation of livestock units are adopted from NÜSSER (1998a: 111) as follows: sheep/goat 0.1, bovine 0.8, donkey 0.5 and horse/yak 1.0.

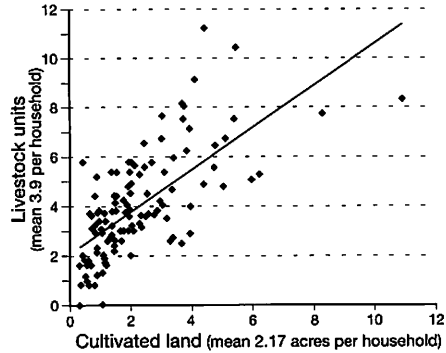
<sup>123</sup> The relationship between available able-bodied males (over 15 years) in a household and number of goats has been empirically proved for Kalash Valley (cf. PARKES 1992). Although the organisation of labour and the animal husbandry system is different there, the male labour force is one of the important factors controlling herd size, just as in the case of this village.

a) Household size and livestock units



Source Author's own survey, 2001

b) Cultivated land occupancy and livestock units



**Fig. 4.2 Odier: Relationship between Household Size Cultivated Land Occupancy and Livestock Units**

members were responsible for performing rotational grazing once or twice in a month, depending on the total number of households in the rotation-grazing organisation. Children also helped with this task, except in the case of yak grazing. Because yaks were mostly kept in the high pastures and only brought to the summer settlement (Romolasht) for three to four months during the winter season, only able-bodied males were responsible for the seasonal tending and all other associated responsibilities. Similar to the yak-herding practices in Yasin valley (cf. STÖBER & HERBERS 2000: 42), the yaks were neither milked nor reared as a draught animals or beasts of burden in the village, as they are in others parts of High Asia (cf. KREUTZMANN 1986; HASERODT 1989a; BISHOP 1990: 247; STEVENS 1993; CROOK & OSMASTON 1994; ISRAR-UD-DIN 1995a; BUTZ 1996; and FAIZI 1996b: 90). In Odier, the yaks are principally used as a source of meat and hair for domestic handicrafts. Since the late 1980s, the increasing numbers of households participating in the seasonal migration and children attending school have also stressed the availability of labour for keeping yak throughout the whole Mehlp Valley (cf. Chap. 5.3).

**Tab. 4.1 Odier: Clan-based Livestock Ownership 2001**

| Clans        | Sheep      | Per (Hh)    | Goats      | Per (Hh)    | Cows       | Per (Hh)    | Cattle     | Per (Hh)    | Cultivated land occupancy | Average land occupancy: acre per household |
|--------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|---------------------------|--|
| Bulay        | 197        | 6.35        | 75         | 2.42        | 54         | 1.74        | 97         | 3.13        | 71.706                    | 2.31                                       |
| Khushay      | 10         | 3.33        | 0          | 0.00        | 5          | 1.67        | 10         | 3.33        | 1.819                     | 0.61                                       |
| Nasketek     | 56         | 5.60        | 22         | 2.20        | 19         | 1.90        | 38         | 3.80        | 15.213                    | 1.52                                       |
| Shadeyay     | 43         | 8.60        | 28         | 5.60        | 9          | 1.80        | 18         | 3.60        | 6.078                     | 1.22                                       |
| Shaipay      | 182        | 11.38       | 74         | 4.63        | 33         | 2.06        | 70         | 4.38        | 38.464                    | 2.40                                       |
| Somalay      | 324        | 5.89        | 249        | 4.61        | 104        | 1.93        | 195        | 3.55        | 131.491                   | 2.39                                       |
| <b>Total</b> | <b>812</b> | <b>6.77</b> | <b>448</b> | <b>3.73</b> | <b>224</b> | <b>1.88</b> | <b>428</b> | <b>3.57</b> | <b>264.771</b>            | <b>2.21</b>                                |

Source: Author's own survey, 2001

Different species of livestock reared in Odier include goats, sheep, cattle, donkeys and yaks. Almost every household owns milk cows and a few sheep. Only three households have yaks, and there are 10 households with a single donkey each. On the average, according to the collected data, there are 6.8 sheep, 3.7 goats, 1.9 milk cows and 3.6 cattle per household.<sup>124</sup> It is important to keep in mind, however, that there is a wide disparity among the households at the village level, as well as the clan groups. In reality, more than 60 percent of the total households do not have goats, and 47 percent, not a single bull (Tab. 4.1).

### 4.3.2 Organisation of Animal Husbandry in Space and Time

In the mountain environment, the location of pastures and seasonal grazing grounds along with traditional access rights are the important factors in shaping mobile animal husbandry. The possibilities of seasonal outdoor grazing of sheep and goats, along with the movement between the pastures/grazing grounds and the houses, determine the patterns of use. These usage patterns vary accordingly and lead to two different forms of organisation during the summer season.

The mountain villagers either send most of the sheep and goats to the alpine pastures for about three to four months, or else they keep the sheep and goats with them in the summer settlements with cultivation, and take them to the pasture on daily basis.<sup>125</sup> In

<sup>124</sup> For comparative figures on the households' ownership of different livestock species in other parts of the northern mountainous belt of Pakistan, see SAUNDERS (1983); KREUTZMANN (1986, 1996b: 67, 2000a); HASERODT (1989a: 123); MASOODUL MULK (1991); BUTZ (1996); GONWFP (1997: 201); FAZLUR-RAHMAN (1998); CLEMENS & NÜSSER (1998a, 2000); GOP (1999: 19); SCHMIDT (2000a) and STÖBER (2001).

<sup>125</sup> In all the villages of Mehlp Valley the households do not shift their sheep and goats to the high pasture. In the living memory of the Odier villagers, only a single attempt was made to shift the sheep and goats to the alpine pasture. Due to unknown reasons, this was never repeated.

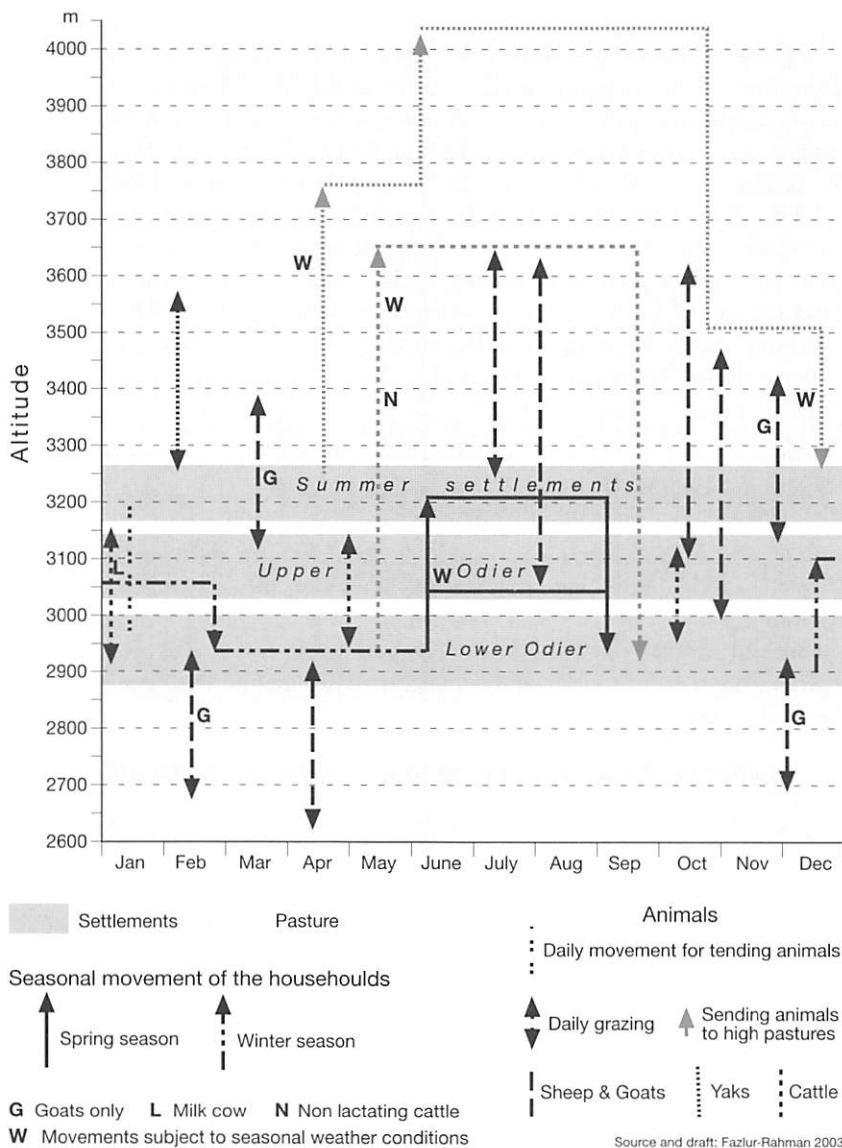
this context, the flexible organisation of time and space as a way to mitigate seasonality and the scarcity of resources is one of the common traditional livelihood strategies adopted in most of the mountain regions of the world. This integration of time and space clearly demonstrates the optimal utilisation of resources held in different ownership regimes – i.e., communal and individual (cf. BARTH (1956a, & b; NETTING 1974; RHOADES & THOMPSON 1975; PARKES 1987; BUZDAR 1988; BISHOP 1990; SNOY 1993; EHLERS 1995, 1996, 1997; NÜSSER 1998a & b, 1999 and KREUTZMANN 2000a). This system generally varies depending on the composition of livestock and utilisation of the high-altitude alpine pastures or grazing lands in and around the village. Each animal species has special fodder, tending and grazing requirements. In Odier during the outdoor grazing season, livestock is distributed over a wide range of elevations, ranging from 2,900 to above 4,000 m a.s.l. (Fig. 4.3).

During the winter season, only two livestock species, goats and yaks, are grazed outdoors, and they receive supplementary feeding once or twice a day, early in the morning and in the evening.<sup>126</sup> Other animals are completely stall-fed. The cattle are driven to the nearby spring once a day for water. On sunny days, the lactating cows, donkeys and oxen are tethered at the mangers outside the stable. Sheep and young animals are always kept inside the byre. There they are provided with drinking water once a day, and are fed four times a day (cf. Chap. 4.3.2.8). The goats are brought into the byre to join them for only the early morning and evening feedings. This complicated pattern of grazing arrangements corresponds to the village's environmental setting and its available forage and grazing resources.

#### **4.3.2.1 Cattle and Milk Cow Grazing in the Vicinity of the Dwellings**

Outdoor grazing of cattle begins around the last week of April in the lower part of the village. For two to three weeks, depending on the weather conditions, all the cattle (both lactating and non-lactating) are grazed together on the irrigated grass. In the past, before shifting the non-lactating animals to the high pastures, a different tending system was practised, based on a village-level turn system. Previously, the non-lactating animals were shifted to the nearby pastures for free grazing. The turn holder was responsible to collect the cattle in a barn every evening. He would sleep next to the barn, to guard the cows against predators. In normal circumstances, this arrangement lasted for about four weeks. Participation in the turn system was compulsory for all households of the village, irrespective of their cattle ownership. The justification for this obligatory service was very simple: all the households were equally dependent on the cattle for ploughing fields and threshing crops.

<sup>126</sup> For further details on animal husbandry and seasonal movement of livestock in High Asia, see BARTH (1956a & b); BISHOP (1978, 1990); BJØNNES (1983); SAUNDERS (1983) CASIMIR & RAO (1985); KREUTZMANN (1986, 1993b, 1995a, 2000a, 2000e); PARKES (1987, 1992); HASERODT (1989a); HEWITT (1989); SNOY (1993); STEVENS (1993); OSMASTON et al. (1994); EHLERS (1995, 1996, 1997, 2000a); HERBERS & STÖBER (1995); UHLIG (1995); BUTZ (1996, 1998); CLEMENS & NÜSSER (1996, 2000); NÜSSER & CLEMENS (1996); FAZLUR-RAHMAN (1998, 2000); MAC DONALD (1998); NÜSSER (1998a & b, 1999); AZHAR-HEWITT (1999); EHLERS & KREUTZMANN (2000b); FISCHER (2000a); HERBERS (2000a); SCHMIDT (2000a) and STÖBER & HERBERS (2000).



**Fig. 4.3 Odier: Time and Space Organisation in Animal Husbandry**

Later on, however, with the amelioration of cultivable land, the availability of fodder in the village improved and the practice of compulsory cattle tending in the early spring season was abandoned, once for all. Nevertheless, the villagers' dependency on cattle still persists. All the households in the whole village are totally dependent on draught power for ploughing, and in the summer settlements, threshing is still done in the traditional way. Nevertheless, at present only a few households are shifting their cattle to the summer settlements. In this case, someone lets them out for unattended grazing

early in the morning. Likewise someone collects them in the evening and drives them to the stables for overnight stay.

Solely the women carry out the grazing arrangements for lactating cows and young calves. This is organised differently than for the other cattle, to ensure the daily availability of milk for black tea and other dairy products during the summer season.<sup>127</sup> Similar to the general practice in most parts of Chitral (cf. NÜSSER 1999), and in contrast to the observations of ISRAR-UD-DIN (1965: 149), the milk cows are kept at home all year round, under very good supervision. The female household members usually graze them together with young animals at the lowest altitude, mostly around the dwellings, for the whole summer season. The lactating cows and other animals are let out twice a day and driven to the nearby irrigated and privately owned pastures for controlled grazing.

This daily outdoor grazing of lactating cows usually takes about four hours, two in the morning between 8:30 or 9:00 and 10:30 or 11:00, and two hours in the evening from 15:00 to 17:00 hours. Sometimes, the lactating cows are also driven to the lower part of the village. Aside from this controlled grazing, they are also fed with green fodder, mostly clover, once or twice daily. Most of the kitchen waste is also given to them. Early in the spring, before sending the non-lactating cattle to the high pastures, and late in the autumn after the termination of the free-grazing season, the cattle are brought together with the milk cows for controlled outdoor grazing (cf Fig. 4.3).

#### 4.3.2.2 Turn-Based Goats Grazing Arrangements (*Sotsiri*)

Turn-based grazing of goats through co-operative grazing organisations is carried out throughout the year. This traditional system of goat grazing is a strategy to reduce pressure on household labour resources. It is widely practised throughout the whole northern mountainous belt of Pakistan, including Chitral, and has different local names (cf. BUZDAR 1988; EGGERT 1990: 27; MASOODUL MULK 1991; NÜSSER & CLEMENS 1996; CLEMENS & NÜSSER 1997, 2000; MACDONALD 1998; FAIZI 1999; NÜSSER 1999; FAZLUR-RAHMAN 2000; KREUTZMANN 2000a; SCHMIDT 2000a and STÖBER & HERBERS 2000). The formulation as well as effective application of these grazing arrangements in the village is one of the practical examples of collective action, mutual co-operation and optimal utilisation of limited labour force.

For this purpose, households residing in nearby neighbourhoods of the village are grouped together to make a single grazing group, locally known as *roam*. In the past, there were usually three *roam* in the village. During the summer season, one *roam* was active in the summer settlement (Romolasht) and the other two in the upper part of the village. During the winter season, the number of *roam* in the upper part of the village remained the same. With the villagers' seasonal shift in residences (cf. Chap. 4.5.1), however, the Romolasht *roam* ceased to function, and the *roam* of the lower part of the village would resume, in the beginning of September. The movement of households from the summer to winter settlements did not occur on a fixed date, as is the case of

<sup>127</sup> The consumption of black tea as a single beverage in the village has increased tremendously for the last three to four decades (cf. Chap. 5.2.4).



shifting to the summer settlements in June. Similarly, during the winter season, a few households changed their residences, shifting from the upper to the lower part of the village (cf. Chap. 4.5.2). In this way, the membership of each *roam* changed constantly, as a few households left one *roam* and joined another. Today, only one roam is active, and then only in the summer. The villagers have hired shepherds to take over most of the animals' care (cf. Chap. 5.3.2).

Generally, winter-season turn grazing is conducted only for goats. Since the goat-owning households are relatively few in number, a single rotation turn in a grazing group takes from 18 to 25 days to be completed. During the summer season, however, the sheep are joined with the goats for daily grazing. Consequently, the number of households per grazing group increases from 25 to more than 30. Two persons, one adult and a child above 10 years of age, usually perform a turn grazing. They are responsible for driving the animals to a favourable place for forage and vigilantly looking after them the whole day, protecting them against the attack of predators (wolves). They must be well prepared for any unprecedented event and carry with them a variety of emergency equipment, including a shotgun, a sharp knife and a short piece of rope, three to four meters long. They are also responsible for properly slaughtering any dying animal before its death,<sup>128</sup> carrying the carcass down to the village and handing it over to the owner. In the evening, they drive the herd back to the village.

In order to retrieve the animals from the daily-turn grazer, every household sends one person to the place where the animal passageway enters the arable land. The individual household members then drive their own animals to the stables where the animals are properly counted. In the case of a missing animal, the owner must first confirm that the animal has not gone astray in the village, before informing the turn keeper of the event. If more than four sheep and goats are missing, then on the following morning the turn keeper has to accompany the owner(s) and lead them to the actual sites where the animals grazed the previous day.

During the winter season, the nearby low-altitude pastures are used for grazing, and the total grazing time lasts up to five hours. But in the summer season, the more distant and high-altitude pastures are visited (cf. Fig. 4.3), and the grazing time increases to more than eight hours. The pastures are used systematically according to the season, forage and water availability. To ensure the availability of forage in the low-lying winter-season pastures, no fodder is collected from them. One pasture (Shol) close to the lower part of the village remains almost snow-free throughout the winter, and is thus used for goat grazing during the winter season (cf. Chap. 3.4.6.1). After the snow melts from the other pastures (Nichagh and Yor Teli) (cf. Map 3.5) in the beginning of March, the goats are shifted there for about one month. During this period, the Shol pasture is reserved for forage growth and regeneration. It is then revisited once again in the month of April for two to three weeks. Around mid May this pasture becomes quite hot, and due to water scarcity, the animals are once again moved to Nichagh and

<sup>128</sup> According to the religious teachings, all animals, excluding donkeys and swine, should be properly slaughtered before death. If any animal dies before being properly slaughtered, its meat is forbidden; thus this slaughtering is one of the prerequisites to make the meat edible for Muslims (*halal*).

Yor Teli pastures for daily grazing. No further changes in the utilisation of pasture take place until the households shift to the summer settlements in the first or second week of June (cf. Chap. 4.5.1).

In the summer season, the more distant pastures are visited from the upper part of the village and summer settlements. To ease the women's workload and spare forage for other animals, the sheep are sent with the goats for daily grazing. This practice is carried out up till the autumnal equinox. Then, as the days start becoming shorter, the grazing grounds in the proximity of the village at relatively lower altitudes are visited, and the sheep are separated from the goats for controlled grazing in the village. During the winter season, the animals from the upper part of the village visit the lowest-altitude pastures. This utilisation of pastures based on horizontal distance and vertical ascent varies with the season, length of the day and location of the settlement units. During the most extreme weather conditions in winter following a heavy snowfall, the outdoor grazing in the upper part of the village may be suspended for a short period of time, ranging from two days to a maximum of one week. This interruption in the daily goat grazing ends when intense wind blows away the snowdrifts and triggers avalanches, which also serve to clear some of the snow away. After some patches in the pasture have thus been cleared of snow, daily grazing on regularly basis is resumed without delay. Such extreme situations of winter out-door grazing that benefit from the strong valley winds has been reported from the Nanga Parbat areas of western Himalaya (cf. NÜSSER & CLEMENS 1996 and CLEMENS & NÜSSER 1997, 2000).

#### **4.3.2.3 Collective and Individual Arrangements for Sheep Grazing**

The grazing arrangements for sheep and young goats are carried out on the neighbourhood level. Until the late 1970s, a group of households used to take their sheep either to the nearby communal pasture or to the uncultivated land in the vicinity of the village for grazing. In the former case, there were more than ten participating households per group using the nearby communal pasture, and most of them also sent young girls to take care of the grazing sheep. The sheep were taken to the nearby pasture in the morning, after the goats were sent out, and were brought back to the village in the evening, an hour before the arrival of the goats. Households without sufficient labour force at their disposal were also able to benefit from this practice by providing some food to the grazers. In the latter case (grazing on uncultivated land within the village) there were very few co-grazers, ranging from two to three households. In this case the grazing arrangements were similar to those of the milk cows (cf. Chap. 4.3.2.1), and the sheep were brought back to the stable at noontime for about two hours. They were again taken for grazing for another two to three hours in the evening.

These sheep-grazing practices were common in Odier from early March until the end of November. The grazers in the nearby pastures were also allowed to collect and bring home some firewood every day from the communally controlled pastures. Young girls were predominantly responsible for this seasonal work. In rare cases, boys of the same age were also sent with the animals. At present this entire practice of grazing the sheep separately has been abandoned due to the unavailability of the required labour force (cf. Chap. 5.3.2).

#### 4.3.2.4 Seasonal Tending of Others' Animals as a Barter arrangement

Up until the recent past, caring for the sheep and goats of the neighbouring villagers during the summer season was common throughout the whole Mehlp Valley. This was partially necessary, since many households were and still are tenants of absentee landlords who reside in the neighbouring villages, and according to the traditional tenancy system (cf. Chap. 3.2.3), seasonal tending of the landlords' animals was a part of the tenants' duty. Additionally, other households in Mehlp Valley also followed suit, as there were no other possibilities for earning extra income during the summer season, from June till the end of September. Regular contracts were made between households for this purpose, and every year these agreements were renewed.

This was an additional source of income for many households in Odier Village, as well. The Odier villagers took care of the sheep and goats of several families. The seasonal caretakers received a fixed payment, mostly in kind, in addition to some minor fringe benefits. The livestock owners paid two *bati* of grain (about 5 kg) per local livestock unit (*balach*)<sup>129</sup> to the caretaker at the end of the grazing season. The caretaker was responsible for looking after the herd and preparing the dairy products. After shearing the sheep, the caretaker also transported the wool to the owner along with his share of the dairy products. When a dying animal was properly slaughtered, its meat was taken to the owner's house as soon as possible. Similar to the customary laws in Yasin (STÖBER & HERBERS 2000), Shigar Valley (SCHMIDT 2000a) and other parts of Chitral (FAIZI 1999: 5), in cases of unavoidable loss, neither the seasonal caretaker nor the daily turn-holder were held responsible for the payment of compensation to the owners.

Households who took care of grazing the sheep and goats for many families, and therefore had a large herd, made their own arrangements. Others with smaller herds usually joined the regular rotational grazing system in their respective neighbourhoods. In the latter case, households who were looking after outsiders' livestock were compelled to follow some additional rules (cf. Chap. 4.3.2.5). These rules were strictly implemented and followed to avoid any confusion or uncertainty about the withdrawal of a caretaker from a grazing group, when his tending duties were over and he returned the animals to their owners.

The seasonal care of lactating cows was handled differently. The concerned parties, according to the traditional system, shared the dairy products; and the caretaker was also paid about 40 kg of grain per cow at the end of the season. Yet another system was practised for non-lactating bovines, such as calves, bulls, etc. The caretaker was requested to drive them to the pasture for free grazing in late spring, and to visit them two or three times during the grazing season. At the end of the summer season, the caretaker first informed the owner; then he collected the animals from the pasture and drove them to

<sup>129</sup> *Balach* was an indigenous livestock unit used for exchange, barter or purchase of land etc. This was a common practice in the past, whereby the value of anything offered for exchange or sale, such as land, a gun or a house, was ascertained and fixed in livestock units. In the absence of money, animals were the only means of barter and exchange. Still at present the reciprocal exchanges between the in-laws (cf. Chap. 4.3.4.1) are sometimes measured in this system. One *balach* is equal to two sheep or goats. A cow, bull or donkey are each also considered as one *balach*, whereas a single horse or yak are both equal to two *balach*.

the owner's house. In this case, there is no fixed honorarium for the caretaker, however he is also paid in kind. In case of a death, if the caretaker or somebody else has properly slaughtered the animal, the meat should be immediately delivered to the owner.

#### 4.3.2.5 Rules regarding Rotational-based Turn Grazing

The villagers have formulated specific working rules for the rotational grazing of sheep and goats in the village. These rules are strictly enforced by all co-grazers in the whole group (*roam*), and apply to all individual member households in a turn system. These unwritten rules provide basic guidelines and define the duties and responsibilities of the group members, to ensure the smooth functioning of the grazing organisation. In Odier, the numbers of households in co-grazer groups vary seasonally, due to the seasonal movement of the households (cf. Chap. 4.5). Therefore, there is a particular need for clearly defined guidelines for starting up or resuming the grazing turns in a rotational cycle. Aside from the collective movement of the households to the summer settlements (cf. Chap. 4.5.1), many households also change their residences in the upper and lower parts of the village, thus leaving one *roam* and joining another. This general movement of households in the village necessitates real clarity regarding the resuming of the daily turn grazing.

The co-grazers within the groups have formulated clear rules regarding how to systematically start the turn grazing in the upper parts of the village and summer settlement. The general principles are that a household is not allowed to withdraw from a grazing organisation or shift his or her sheep/goats to another one, if his/her turn is expected within five days. A few households were misusing this rule and joining one *roam* for some time and then, without performing a single turn for that group, leaving it and joining another one. This practice of changing rotational grazing groups within a short time period is now strictly controlled. In this regard, a special rule was created for the households who had developed a bad reputation in the village: they are obligated to perform their turn on the very next day after joining a grazing group. Similar conditions were also laid down for the caretakers who tend others' sheep and goats. It is obligatory for these seasonal caretakers to take an extra grazing turn for the sheep and goats of each household under their custody; likewise they too must perform the first turn grazing immediately after joining a new *roam*.

When the households of the lower part of the village make their general seasonal shift from the winter to the summer settlements (cf. Chap. 4.5.1), names of the next five households due to take their turn in the grazing group are carefully noted (remembered) in their proper order.<sup>130</sup> These households then have to resume their turns in the autumn season, when the grazing system restarts in the lower part of the village – and this, irrespective of whether they have actually rejoined that group or not. Both in the upper part of the village and the summer settlement, the order of the turn grazing is started fresh each year after the collective seasonal shift.

<sup>130</sup> This is practiced only in the lower part of the village due to seasonal movement. In the upper part of the village, the grazing groups remain active throughout the year.

In each case, the initiator of the first turn changes every other year: one year the sequence starts from the south and moves north, i.e., following the slope direction from the upper dwellings to the lower, and in the following year, vice versa.

When a household rejoins a grazing group in the upper or lower part of the village after returning from the summer settlement, he is assigned to take his turn ahead of the person whose turn it was on the day he joined the group. All the members of the turn group concerned always keep this in mind. In the special event that a household is unable to perform its turn, then either it must arrange to exchange its turn with others beforehand, or else the neighbours and relatives make the necessary arrangements, depending on the situation and the nature of the emergency. The turn in a co-grazing group is considered an important communal responsibility and high priority is given to it. Each household makes the necessary arrangements for performing their turn, well before its commencement.

#### 4.3.2.6 Yak Grazing Arrangements during the Winter Season

As is evident from the historical sources (GENERAL STAFF INDIA 1928: 248; ISRARUD-DIN 1965 and HASERODT 1989a: 125), yaks used to be one of the main components of animal husbandry in Mehlp Valley, for quite a long time. Today there are only three yak left in the village, so the collective practices have been discontinued. Unlike the well-established traditional crossbreeding practices in some parts of the Northern Areas (KREUTZMANN 1986; FAZLUR-RAHMAN 1998, 2000; MACDONALD 1998 AZHERHEWITT 1999; CLEMENS & NÜSSER 2000 and SCHMIDT 2000a), in Odier the yak herd was neither crossbred with cattle nor were the two herds ever mixed together. The yaks were also never kept in the winter settlements for stall-feeding. Due to their hardiness and capacity to adjust to the extreme weather conditions, controlled grazing and tending was carried out for only a short period during the winter season, from late December until April (cf. HASERODT 1989a: 125) (cf. Fig. 4.3).

The actual date of driving the yaks down from the high pastures to the seasonal settlement was dependent on the weather conditions. Similar to the situation in Laspur Valley (NÜSSER 1999), in cases of heavy snowfall and declining availability of forage, yaks were driven to the summer settlement. Usually, all the yak-owning households made this decision collectively. Members of most of the concerned households would go together to the pasture to bring the yaks back, and the yaks were then kept in Romolasht and tended by the male members of the family. They were also let out for daily grazing but, because yaks are able to defend themselves, they did not require much care. In the evening, they were simply driven back again to the stables and given some supplementary feed. Generally, because of their semi-domestic nature, the yaks were not milked at any time of the year. After they were let out for free grazing in spring, they were visited once or twice in a week to make sure they were not encroaching on the cultivated land of the neighbouring villages.<sup>131</sup> Around the last week of April, all the yak owners went collectively to the high pasture on a fixed day to shear the animals.

<sup>131</sup> In case of any damage to the crops in the summer settlements of Istaru and Werkup the yak owners are obliged to compensate for it. Otherwise there is no tradition of payment for the damages caused by animals grazing freely in other villages.

For winter-season tending, in contrast to the arrangements practised in Hunza (KREUTZMANN 1986); Shimshal (BUTZ 1996) and Khumbu region, Nepal (STEVENS 1993), the yak-owner households in Odier Village had organised a collective system. The labour arrangements were totally different from the general rotational turn grazing of sheep and goats. A few families within the yak-owners' group contributed one person each, and these individuals were collectively responsible for looking after the whole herd of the village. The number of persons who tended the yak in the winter (*zogh doyou*) was not fixed, but remained constant for a single season. The yak tenders would go to the summer settlement (Romolasht) every day, early in the morning, and return to their houses in the evening. It was, however, not obligatory for all members of this small group to be present every day. Other yak-owning households without spare labour force would provide food to the group every day.<sup>132</sup> The entire group of yak owners had some additional obligations to the *zogh doyou*. For instance, when a yak was slaughtered or sold from the herd, the group of yak-tenders was collectively entitled to the ribs of that yak or an equivalent payment in cash. All the yak-owner households followed this practice very strictly, in recognition of the tenders' services. The yak-tending group also kept regular records of any sale or slaughter, and collected their due share from the owners, sometimes by force. Those yak owners who changed their residences during the winter season (from the upper to the lower part of the village) were also obliged to provide special food to the yak tenders on the day of their residence shift. Likewise, when a she-yak (*gha*) gives birth to a calf during the tending season, the owner was compelled to provide some food to members of the tending group.

As a general rule, the yak calves remain with their mothers for one whole year, and the yaks always remain together in a group while grazing outdoors. This allows them to defend themselves very easily against any predators. In the evening they seek out a protected place for the night and sleep in a roughly circular formation, with all the young animals in the centre and the older and stronger yaks remaining on the fringes. Since most yaks are practically identical to each other in shape and appearance, it was sometimes rather difficult for the owners to recognise their own animals. Therefore, on the occasion of shearing the young yaks for the first time, they were marked with distinct symbols, to provide easily visible means of identification. These symbols were usually carved on the horns; and earrings were attached to those who were poll by birth. Sometimes, for a few yaks a certain number of hairs in some spots of the bushy tail were not shorn, but were left as an identification mark.

Nowadays, the two households that still have yaks tend to them themselves. Still today, during the whole summer season, the yaks graze unattended in the highest-altitude alpine pastures. The owners usually visit the herd two or three times per season. In the past, this was also conducted on turn basis. During his turn, the owner was responsible to count the whole herd and, upon his return, inform the other owners regarding the whereabouts of their yaks and the number of new-born calves. This summer-season

<sup>132</sup> The households without a regular participant in the group would supply the tending group with a thick loaf of bread made from barley flour (later wheat flour). This was freshly baked in the morning and handed over to one of the nearby *zogh doyou* as a token of respect and recognition for their services. If a household failed to provide this daily bread, the *zogh doyou* would not take his animals out for grazing on that day.

turn took two to three consecutive days and was relatively hard work, because the herd was randomly spread out over a pasture area covering more than 50 square km.

#### **4.3.2.7 Problems and Constraints of Poultry Keeping**

Keeping poultry is not very common in the village. There are a number of problems associated with it, and hence it is discouraged in most neighbourhoods. As is clear from the cropping pattern, some of the fields are given to crops throughout the year (cf. Tab. 3.2). Also, due to the successive fragmentation of cultivated land and certain site-selection priorities for house construction, nearby fields do not always belong to a single household. This is the root cause of the problem with poultry, since the birds tend to go directly to the neighbours' fields in search of food. Chickens are considered to be the most destructive birds for the crops, especially during the sowing and harvesting seasons. Therefore, quarrels are common among the neighbours in these seasons. To avoid these internal conflicts, many households have chosen not to keep any poultry at all. On the other hand, households who have enough land in the vicinity of their houses still keep a considerable number of birds. At the same time, poultry diseases have become very common, and in the absence of preventive and curative measures, most of the birds die in a short period of time. Most of the poultry in this village comes from old stock. It is still kept in the traditional way and is not very productive.

With modern techniques, keeping poultry is potentially an excellent source of meat and cash. Nevertheless, the above-mentioned problems present major hindrances to raising poultry in any case, even in the traditional way. Moreover, the long and cold winter season is also a major hindrance for improving and developing the existing poultry keeping system, because there are no good alternatives for heating the brooding centre for about six to seven months of the year. Another constraint in this remote village is the lack of year-round availability of medicine for the hens. The AKRSP officials initiated some efforts to improve the existing situation, but totally failed to achieve the required results, due to the socio-cultural problems. Other birds such as ducks are subject to the same problems, except that they are more resistant to the common diseases.

#### **4.3.2.8 Organisation and Allocation of Fodder for Winterfeeding of Livestock**

As is clear from the above discussion, the animals' grazing patterns and fodder requirements vary throughout the year; nevertheless, winter-feeding is the most important and determinant factor for herd size and composition. This is true not only in Odier, but also throughout the whole Himalayan, Hindu Kush and Karakorum regions of High Asia (cf. BARTH 1956a, & b; HASERODT 1989a; SNOY 1993; OSMASTON 1994: 184f.; NÜSSER & CLEMENS 1996; CLEMENS & NÜSSER 1997; NÜSSER 1998a & b, 1999 and EHLERS & KREUTZMANN 2000a). In Odier, the winter-feeding period varies from six to eight months for sheep/goats and cattle, respectively. Most of the winter fodder comes from the agriculture sector, either as food-crop residue, or grass and fodder-crop harvests. A substantial quantity of fodder is also collected from the pasture areas during the summer season. For some households *moshin* also contributes to the winter-fodder stock (cf. Chap. 3.4.3.2). Thus, resources in every ownership, from private to communal

and clan, and spread over all the eco-niches within the territorial limits of the village, are carefully and systematically combined together to reinforce the basic winter-fodder requirements of a household. In the early autumn season, after all the available fodder has been stored, the households assess the requirements of their existing livestock. All the animals that cannot be fed from the collected fodder stock are either sold to others, exchanged, or slaughtered for domestic consumption.

For feeding, animals are divided into two groups – sheep and goats (*kizi pongi*), and cattle and donkeys (*lot pongi*) – and are kept in two or more stables. Goats and sheep are housed in the nearest stable. Donkeys are kept in separate sheds (cf. Fig. 3.10). The young calves are kept together with the goats and sheep, while lambs and kids are placed in a separate section. When there are a considerable number of lambs and kids, a separate section is often temporarily constructed for them. Otherwise all the houses have a small rectangular enclosure, about one square meter in size, located in the corner between the wall and the bin in front of the door that leads to the animal sheds from the house. The newly born lambs and kids are placed in this small enclosure (*shokal*) to protect them from the extreme cold and congestion in the stable (cf. Fig. 3.10).

The fodder and hay stocks are very carefully rationed among the animals, according to their productivity and needs. The fodder rations are scant. They have to be scrounged together in a hand-to-mouth fashion, and are much less than the animals' overall daily requirements. They are mostly given fodder that has been collected from the pastures, tree leaves and grass harvested in the village. Hay, fodder from maize, and chaff, occasionally mixed with grass or lucerne, is reserved for the cattle. They are normally fed three times a day: at about 7:30 in the morning (*hasi*), at 10:30 (*azaralak*), and in the evening around 18:00 hour (*both*). For lactating cows and oxen, this daily ration is increased and supplemented by grain or cooked bread, which is necessary in order to maintain at least a minimum yield of milk and keep them strong enough for the early spring-season ploughing. The weak and pregnant animals are also given some extra food or grain (*bash*). The donkeys are always given about half a kilogram of barley (*ri-wish*) every day in the evening, and this amount is slightly increased during the winter season. Nevertheless, their overall feed ration is also less than their normal daily diet requirements. This under-nourishment has a very bad effect on the productivity and health of the livestock. The cows' milk production decreases drastically, and after mid winter, the sheep and goats have become unsuitable for slaughtering.

In the early spring, the food ration for the livestock is further decreased, and in extreme cases the animals became so weak that they cannot even walk to the nearby pastures. Requesting neighbours and relatives for help with fodder supplies is very common in spring. Many households must either buy fodder from their neighbours or import it from the low-altitude villages. Similar to the traditional practice of winter-season fodder provision in the Hindu Kush and Himalayas (cf. HASERODT 1989a; SNOY 1993; BAIG 1994: 121; KREUTZMANN 1996b: 71; CLEMENS & NÜSSER 1997; NÜSSER 1998a & b, 1999 and NÜSSER & DICKORÉ 2002), around mid February when the fodder stocks are dwindling, willow and poplar branches (*ghrosk*) are provided to the sheep and goats, preferably in the evening. This practice lasts until the beginning of April. Usually the small willow or poplar branches (*ghrosk*) are given directly to the animals; the bark is



removed from the thicker branches and also used as fodder. Whatever is left over from the small branches after the sheep/goats have eaten from them is used for firewood, and the thick peeled branches are used as building material. A very few households in the village manage barely to be self-sufficient for their winter fodder. Although their livestock also suffers extreme malnutrition, they do not have to buy fodder from others. In certain cases, different types of fodder are exchanged between relatives and neighbours – e.g. hay and crop residue are exchanged for willow branches or lucerne etc. – depending on availability and domestic needs.

### 4.3.3 Animal Products as Sources of Energy and Material for Local Handicrafts

Aside from manure, which is one of animal husbandry's main contributions to maintaining arable land fertility, livestock furnish other products as well. These are milk, meat, wool and hair. Wool and hair are mostly used in domestic handicrafts, usually for household needs.<sup>133</sup> Sheep are shorn twice a year, and then exclusively the women process the wool, making socks, pullovers, quilts and woollen cloths out of it. The traditional long woollen robes (*shuqa*) are also sold in the market. The hair of goats and yaks is used to make rugs and ropes. Unlike the common practice in Shigar, where goats are shorn twice a year (cf. SCHMIDT 2000a: 127), in Odier the goats and yaks are shorn only once in the spring. Exclusively the men process this wool and hair.

Animal hides and skins are also processed. Leather is made into sacks for storing grain and flour, and rough working gloves for harvesting thorny bushes, like wild rose and sea-buckthorn. Relatively softer gloves are made of goat- or sheepskin, and are used during haymaking and harvesting. In the past, leather shoes were also manufactured locally, but now, due to the availability of plastic shoes, they are no longer needed. Nowadays only a special kind of footwear for the winter season is made – a kind of inner-shoe that people do not have to remove inside the mosques, which much simplifies the ablution rituals required for the daily prayers. A multi-purpose plain goat- or sheepskin, locally called (*warang*), is used to protect the body from thorny bushes and while transporting heavy loads, such as firewood, manure, fodder, from place to place. Until recently, the *warang* was also worn during the winter season on top of warm clothes, mostly by old men.<sup>134</sup> At present, the ready availability of other clothing made from thick materials manufactured by lowland industries has partially replaced this usage of the *warang*. But for the transportation of thorny bushes and during harvesting of crops, it is still used as the main protective material. The supply of meat for household consumption, as well as on special occasions for guests, mostly comes from sheep and goats. Animal sacrifices on special occasions are another important use, emphasising the ritual and religious importance of animal husbandry (cf. HERBERS & STÖBER 1995 and HERBERS 2000a).

<sup>133</sup> During the feudal rule; most domestic handicrafts were also taxable items, and a fixed number of each item was collected from the respective administrative units by the former rulers AZIZ-UD-DIN (1897) and (IOR/2/1077/235/11826/214-213).

<sup>134</sup> It has been reported from Zangskar (Ladakh) that the young women and teen-aged girls there also wear this type of long-haired goatskin (OSMASTON, et al. 1994: 233). Its use and popularity there is quite obvious from photographs 52, 53, 63, 65, 67, 68, 91 and 92 in sections two and three of the cited book.

Despite the extensions in irrigated plantations and regular firewood collection from the common pastures (cf. Chap. 3.4.4.1), the domestic energy needs for heating and cooking still exceed the supply. This gap in domestic energy resources is mostly met through animal husbandry, as in other parts of the region, by burning dung (SAUNDERS 1983; HASERODT 1989a; BAIG 1994: 123; HERBERS 2000a and SCHMIDT 2000a). Dung is an animal product used for heating and cooking purposes, and it provides almost half of the fuel needed by a household in the village. This is in contrast to other parts of the Northern Areas (Khaplu/Baltistan), where it contributes only 7 percent of the household fuel requirements, and the national level, where 18 percent of the needs are met by it (cf. CLEMENS & NÜSSER 1997: 253, Tab. 3).

In Odier dung is used in four different forms, two of which are used exclusively for summer, and two for the winter season. The first form of dung is called *ganguruk*, and consists of dried-out outdoor animal droppings. The women collect this form of dung after it is dry, from the nearby village surroundings during grazing hours in the summer season. Men and young boys also collect *ganguruk* regularly from the high pastures, from the beginning of July until the end of October. For this purpose they usually make trips to the high pastures early in the morning, returning before noon to participate in other agricultural activities. Depending on their age, they can bring up to a full sack (ca. 40 kg) of dried dung in a single trip.<sup>135</sup> The women also collect the animals' night droppings every morning from the byre. This is the second kind of dung. Large circular patties (*paqun*) are made out of it and left on the roofs of the houses to dry out. Most of these two types of collected dung is used as fuel for cooking during the summer season. During July and August, while the cattle are in the summer settlement, dried manure that has been reserved in the cattle sheds from the previous winter in the lower and upper parts of the village is dug out in blocks (*dordi*) of various sizes. Similar to the usual practice in Zangskar, these blocks are then stored for the winter season (cf. OSMASTON, FRAZER & CROOK 1994: 81, 109). When this latter activity is not possible, either because of continuous use of the stables or because low temperature conditions have not allowed the dung to dry out in the stables, the dung is taken out from the sheds as it is. Bricks are made out of this moist dung and placed in the sun for drying. Both these last two types of dung, the dung bricks and *dordi*, are then stored for winter-season consumption.

#### 4.3.3.1 Processing and Use of Meat, Milk and its Derivatives

Meat and milk are the main sources of dietary enrichment in the village, and are both subject to seasonal fluctuations in supply, closely associated with weather conditions. During the summer season, due to adequate availability of fodder, there is enough milk – usually more than needed for daily consumption. The milk is both consumed

<sup>135</sup> Collection of animal droppings from the high pastures to be used as manure for the fields is not a common practice in this village, as elsewhere (cf. STEVENS 1993: 129). Only a few households from this village occasionally transport a limited amount of manure from the high pastures. In such cases, the droppings are usually collected from the animals' sleeping sites (*poshghal*) and taken down to the village in the autumn season on human back. Deficiencies in manure supply are generally compensated for by exchanging fodder (crop residue) with neighbours and other households.

fresh, e.g. in tea, and, as in other parts of the Northern Areas (cf. HERBERS 1998: 77; KREUTZMANN 2000a: 99 and STÖBER 2001: 146), it is also processed. The processed products (butter and low-fat cheese) are also used both for fresh consumption as well as stored for future needs. In the latter case, both butter and low-fat cheese are put into earthen bowls or tins and buried underground in a moist place (cf. BIDDULPH 1880: 84 and HASERODT 1989a: 124). They are reserved and dug out for ceremonial dishes on special occasions, i.e. marriages etc., and are also used as an item of exchange between relatives on such occasions. Unlike in Yasin Valley, where “many households depend on the sale of milk products” (HERBERS 2000a: 196), this practice is quite unusual in Odier.

During the winter season there is only sufficient milk for the black tea. The low temperature conditions, however, are favourable for the storage of meat. Depending on what the household can afford, a minimum of one to a maximum of three animals is slaughtered between December and March. There is a traditional order of slaughtering the animals: first cattle, followed by goat, then sheep or ram. The meat is usually stored in a separate room and consumed throughout the winter season. However, this practice of storing meat is now dwindling. Because of the excessive male out-migration in winter season and the high degree of dependence on imported foods, the suitable animals are no longer being slaughtered; rather they are being sold to others or bartered with the local shopkeepers in exchange for other food items.

Slaughtered animals (meat) are also one of the main exchange items between the relatives and in-laws on the occasion of marriages.<sup>136</sup> As it was, and still is, beyond the means of a single household to provide enough meat both for the marriage celebration and to meet the demands of the bride’s family, this has become a well-developed reciprocal activity between relatives. Moreover, slaughtered animals are also the main gift presented at the time of visiting a relative who has returned to the village after a long absence, as well as on the occasion of a child’s birth within the circle of relatives (cf. Chap. 4.3.4.1).

#### 4.3.3.2 Wool Processing: Making Products for Self Use, Exchange and Sale

The main raw material for the domestic handicrafts in the village is wool from sheep and yaks. Before shearing, the sheep are scrubbed in running water or in small pools. Locally made scissors-like instruments (*sayreil*) are then used for the shearing. Afterwards, the wool is sorted according to its colour and quality (softness and length of fibre) and placed accordingly in bags, tins and baskets. The different steps of the wool processing

<sup>136</sup> Up till the recent past, the bridegroom’s family was expected to provide the bride’s family with a certain number of slaughtered animals, or *bar* (literally “load”). This was an obligatory practice in the valley. The family of the bride usually demanded a set amount (occasionally up to 16 or 25 *bar!*), along with other items (cf. Chap. 4.3.4.1). This meat was distributed among the households of the bride’s local clan and other relatives. The entire contribution of the groom’s family was known as *pandar*. In return, the bride’s family makes their own contributions (*chighich*), both to the bride and to the groom’s family, and the latter is then distributed among the close relatives of the groom in reciprocation for their contributions to the *pandar* (cf. Chap. 4.6.3.1).

depend on the wool's intended uses and its natural colour.<sup>137</sup> For making woollen cloths, white wool is usually dyed before any further processing; walnut shucks are used for this purpose (Fig. 4.4).<sup>138</sup> The walnut shucks are first boiled with water in a large pot; then the wool is put into this mixture. To make the colour uniform and strong, the pot is kept boiling for some time. Then the wool is removed and put out in the sun to dry. For other uses, such as making blankets, pullovers and socks, raw wool is mixed with fine earth (*puchuti*), to reduce its greasiness and make the eventual teasing easier. After the above-mentioned process has been completed, the wool is distributed among the female household members, who put it into small double-sided baskets (*warkheti*), 15 to 20 centimetres in depth, exactly resembling a figure '8'. This is exclusively a women's tool, and is made by them from poplar bark or wheat straw. One side of the '8' is filled with raw wool; the women take the raw wool from this side, tease it, and gradually fill up the other side with the teased wool. The women always take their own basket with them while they are tending the animals grazing outdoors in summer. In some cases, the female head of the household will give her daughters and daughter-in-laws each the assignment of finishing teasing one *warkheti*-full of raw wool in a day.

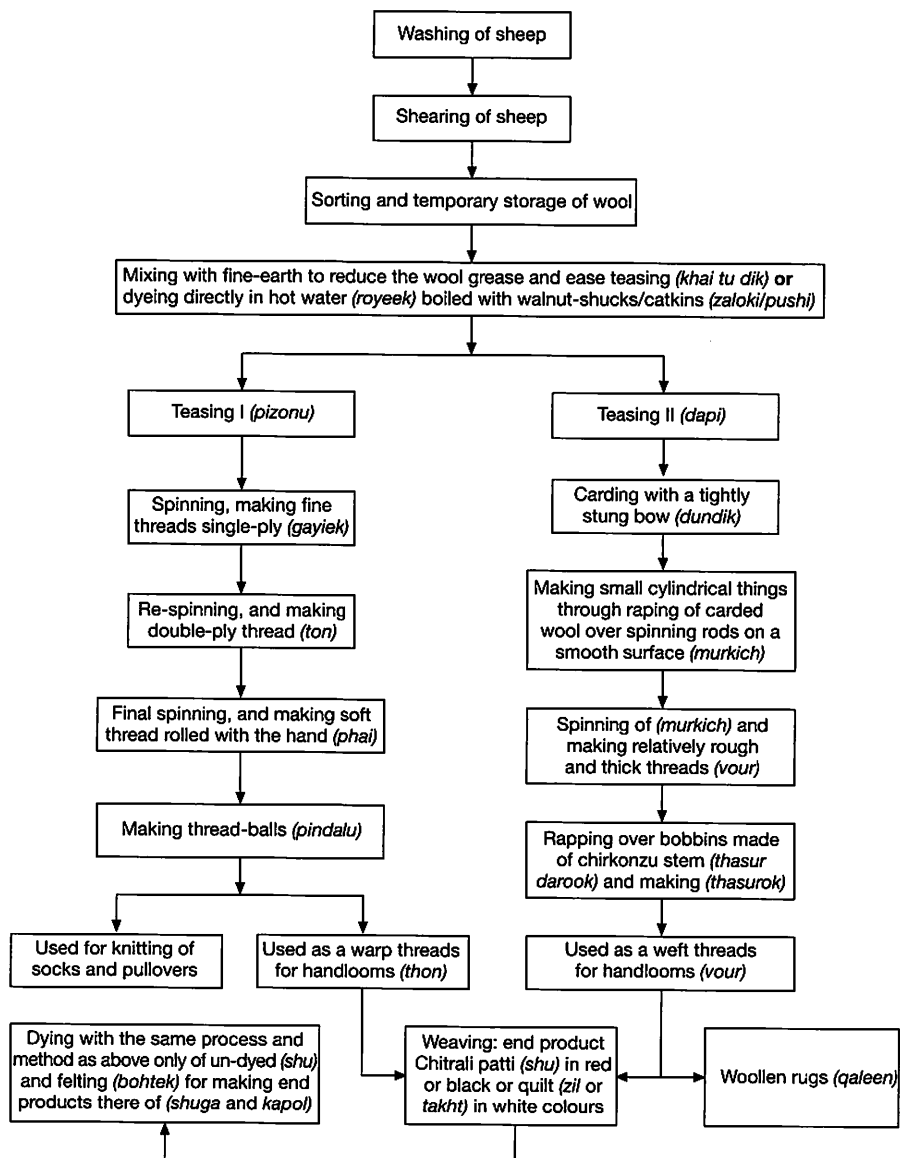
Black wool is collected and stored separately. Yaks are its main source; however, a few sheep of the herd also supplement the supply. Depending on its quantity, it is used in its natural colour for making woollen cloth or other items. In general, this colour is not particularly prized in the traditional culture. The principal customers for the black *shuqa* were the nomadic *Gujur*. Quilts are never made out of it. In the past, loose woollen coats (*raghz*) were usually made for females from this black wool. The lambs' wool (*karbeli*) is highly prized for its softness and natural colour. Normally lambs are shorn separately, according to their age, and their wool is also left to grow longer than that of the adult sheep. The lambs' wool is also separately stored. Especially high-quality products, such as socks, gloves, pullovers and shawls are made out of it.

Carding of raw wool is also undertaken according to the wool's intended use. Fine and long-fibred wool is processed separately. After it has been teased, small specially formed clumps (*pizonu*) are made out of it for spinning. The elderly women usually do the spinning, using the traditional spinning wheel (*chakhur*).<sup>139</sup> First of all, fine, thin single-ply threads are spun; then they are joined together to make a double-ply. The resultant yarn is first rolled by hand during the final spinning, and then it is made into various-sized round balls of yarn (*pindalu*) for further use and convenience. These balls of yarn are the end product and are either used directly to make socks and pullovers

<sup>137</sup> There are some variations in the processing of wool within Chitral District. Most probably, the techniques vary from one valley to another. But in all cases, the end products are the same, except for the natural-coloured *shuqa* made in Baroghol. This anomaly can be attributed to the indigenous Wakhi culture or to the unavailability of walnut shucks. For more details and comparison, see FAIZI (n.d.).

<sup>138</sup> A short description on wool processing in the Kalash Valley has been presented by SPERBER (1996: 391ff.). There are some differences between the way wool is processed in Kalash Valley, compared with in the Kho inhabited areas, i.e. Mehlp Valley, Torkhow tahsil – and Odier.

<sup>139</sup> The origin, structure and function of the spinning wheel used these days in Chitral has been attributed to the expansion of central Asian culture (FAIZI n.d.).



Source Draft and drawing, Fazlur-Rahman 2003

**Fig. 4.4 Wool Processing in Odier Village**

etc., or are stored to be used as warp threads in the handloom, for making woollen cloths. Special care is taken and every effort is employed to make the yarn as strong and fine as possible.

The rough and coarse wool is also teased, and circular clumps (*dapi*) are made out of it. These are then carded with a strung bow (*dundini*). This is relatively hard work, and needs a lot of space in the house. Usually the whole house is set aside for this work.

For a single person, it is a time-consuming task; therefore, it is done collectively at the neighbourhood level, with reciprocal labour exchange. First, the teased wool is piled in many circular-shaped heaps and heavy stones (usually bin covers) are placed on top of them and the carding bows are set up. A certain quantity of wool is taken from the pile by each of the helpers, and then the bowstring is repeatedly vibrated through the small piles, separating the fibres into a loose, fluffy mass. A certain quantity of this carded wool is placed uniformly on top of a flat, smooth surface and wrapped around a spinning rod, making small cylindrical shapes about 20 centimetres long (*murkich*), to facilitate spinning. These are stored in baskets and spun into thick single-ply threads on the spinning rods. The resultant coarse yarn is then used as weft threads (*vour*). It is wound around small bobbins, about eight inches long, which are usually made from common sorrel (*chirkonzu*) stems. The length and thickness of the bobbins are adjusted according to the size of the shuttle. Generally, the women know what number of bobbins is needed for a required length of woollen cloth. In case there is a deficiency, the required extras are either newly prepared or borrowed from neighbours and relatives.

The finished threads are now ready for weaving woollen cloths. According to the domestic needs and based on the width of the woven cloth, there are three different types of heddles or handlooms (*sakht*)<sup>140</sup> used in the village; one for making quilts, another for general woollen cloth for *shuqa* and caps etc., and a third for making leg-wrappings (*paitawa*). Depending on the type of cloth, the initial weaving area is chosen and cleared of undesirable items, including bushes and snow, etc., to keep the woven threads clean. Then on one side of the space, the heddle is fixed into place with strong pegs, and on the other side, a small wooden fork to hold the warp threads is held in place with a heavy stone. Helping hands are needed for the next steps, in which the warp threads are woven onto the handloom. This is accomplished through the repeated movements of two or more persons, connecting the yarn back and forth between the heddle and the wooden fork. An expert, usually a senior woman (*binak*), is needed to make the proper knots attaching the warp-threads to the handloom. This is a specialised work, and only a few women can perform it correctly. In order to supervise the work and tie the knots on the heddle, the *binak* squats close to the heddle. Every time the ball of thread passes between the fixed points, she cuts the thread and ties it to the respective handloom threads with a bow. After finishing this process, the whole thing is put into a basket and taken to the weaver (always a man), along with the required bobbins wrapped with weft thread. Traditionally a thick loaf of baked bread is also carried with it for the weaver.

Generally the handloom is set up on one side of a house, mainly in the upper left side of the *tek* section, where it can be easily attached to the back wall. Either a wooden box or a small bin (*kash*) of the required height is placed there as a seat for the weaver. The handloom functions according to the general principles of weaving, whereby the two sets of warp threads are alternatively raised and lowered by the heddle. This shifting

<sup>140</sup> This single word is used for all three kinds of heddles, with the addition of prefixes. There is the *takhto sakht* (quilt heddle – 45 centimetres broad), and the *shuo sakht* and *paitawo sakht*, the heddles for woollen cloth, the first 30 centimetres wide, and the second, for leg-wrappings, 15 centimetres wide (personal communication with MOHAMMAD AMIN, Chitral 2002). The origin of this name used for the local heddle or handloom is traced from a Persian word, *saakhtan*, meaning to “make something” (FAIZI n.d: 8).

creates a tunnel or 'shed' in between the alternate layers of warp threads. The shuttle (*maku*) is passed through this shed, carrying across the weft thread, which is then beaten smooth against the finished fabric by moving the reed. Then the heddle is shifted to reverse the position of the two sets of warp threads, thus binding the weft thread with the fabric and opening the next shed. This process is repeated until the whole fabric is completed. The weaver is then paid mostly in kind, with such goods as firewood, fodder, etc. according to his needs and sometimes his demand.

After the weaving is completed, the woollen cloth is ready for felting (*bohttik*), which is exclusively done by men. Depending on the season, the cloth is either taken to the nearby spring or the whole process is carried out at home. For felting, the cloth is dipped into water; then it is laid on a flat, smooth-surfaced stone and trampled with the feet until the fibres cling together and the fabric becomes compact and thick. A helper is usually needed for this work, which takes up to three or more hours depending on the quality of the fabric. After felting, the cloth is placed in the sun to dry, then it is measured in yards and rolled together. An expert male or female cuts the cloth to a standard size in preparation for making the long and loose robes (*shuqa*). One robe requires about six meters (16 hands) of woollen cloth. After cutting, the various pieces are sent to different persons for sewing.

As in Yasin (cf. STÖBER 2001: 197), in addition to normal daily-wear *shuqas*, a special *shuqa* is still part of the traditional dress of a bridegroom. Particular care is taken in sewing the wedding *shuqa*. Well-trained and expert women, sometimes from outside the village, are approached to sew some parts of it, making in particular special designs and attractive patterns on the collar. The ability to do this work was highly regarded in the past. The finished marriage *shuqa* is also decorated with circular patterns on the front side with ornate dangling tassels attached to them. A few skilled women in the village make these special ornaments.

The cloth intended for quilts is not felted immediately after weaving. It is simply cut into pieces and sewn together, and then two pieces of the same size are attached to make a reasonably sized double-ply blanket (*takht*). To make them compact and warm the completed quilts are felted every second year. They are the main exchange item between the in-laws after the marriage, and are especially given to the bride as a wedding gift and after the birth of her first child (cf. HERBERS 1998, 2000a).

Another local woollen product is an ornately patterned woollen rug, known as *qaleen*. The usual weft threads are used in making the *qaleen*, but in this case, the warp thread is purchased from the market. Very delicate patterns and designs are made on these rugs. One of the characteristic features of these woollen rugs is that they are woven in such a way that both sides present the identical design and pattern, without any minor differences. They are woven on the same traditional looms used for coarse rugs (*paylesik*) (cf. Chap. 4.3.3.3) and are therefore the same size, usually about 1.2 meters long and 0.7 meters broad. Only expert men and women make these carpets. They are very popular within the district as bridal gifts, and fetch a good price in the local market. For making these carpets, the wool must be dyed in different colours, and these dyes are also purchased from the market. However, in Odier the *qaleen* are not as commonly made as quilts or woollen cloth. In former times, there were only a few families in the

whole Chitral state in this profession. They were mostly engaged as hand workers to make fine woollen rugs for the rulers and other state officials.

There is also the typical woollen cap (*kapol*) that was the national headgear of the whole Chitral District. Even today the local people mostly wear it all year round. This cap became very popular during the Russian-Afghan war, as most of the anti-Russian Afghani leaders were wearing it. Later on it also became popular among the refugees, as well.<sup>141</sup> With the passage of time, the design, style and size of this cap changed many times, according to the market demand. The design of the local *shuqa* changed slightly during the 18<sup>th</sup> century, when it was embellished with more embroidery, becoming a *chughha*, and was used for ceremonial purposes. Later on, after the mid-1950s, the *chughha* design was modernised with new machine tailoring and embroidery techniques, to meet the market needs (FAIZI n.d: 4). All this happened mostly in the lower part of the district, however, and in the remote areas, the old traditions are still followed.

In general, woollen cloth became one of the main marketable products for earning cash in some parts of the Chitral district. In this respect, only some areas of the district were able to produce excellent quality cloth (c.f. Chap. 5.5). Still today, the other areas remain well behind, as they are unable to compete with the quality of woollen cloth made elsewhere.

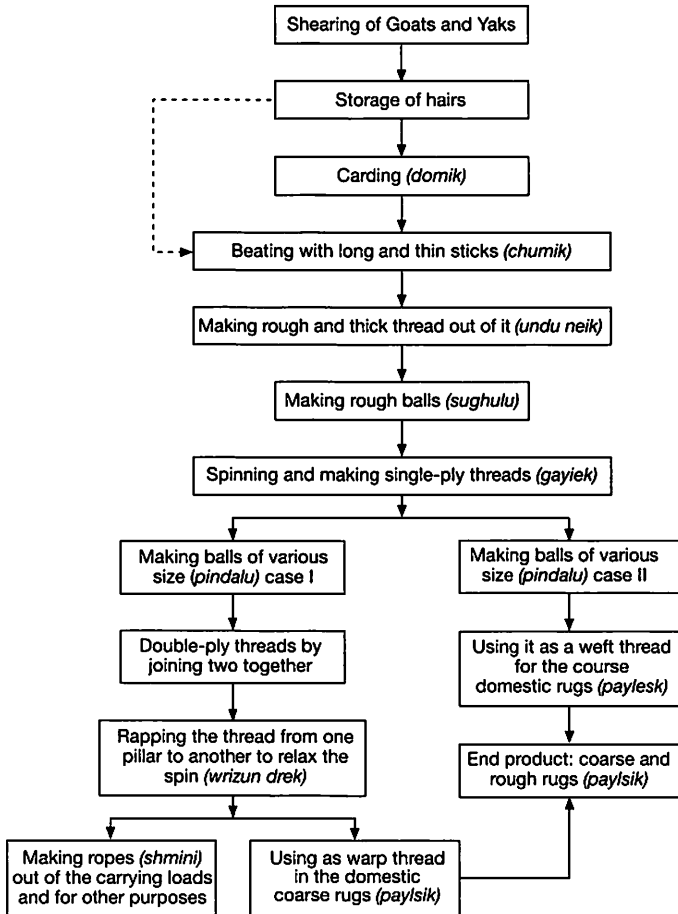
#### 4.3.3.3 Hair Processing and Making of Coarse Rugs and Ropes

Another important raw material for domestic handicrafts is hair collected from yaks and goats. The yak hair is softer, and the goat hair, a bit coarser. After shearing, the hair is sorted according to its natural colour – black, white and brown – and is then used as it is. The processing of the hair starts either by hand-teasing it or beating it with long, thin sticks. This is repeated for each colour, separately. In the former case, the hair is first teased and then carded with sticks (Fig. 4.5). In the latter case, raw hair is whipped with sticks (*chumik*)<sup>142</sup> and mixed together. After the hair has been gathered together in a fine, fluffy mass, it is temporarily stored in bags and baskets. For spinning, a thick, rough thread is made by two persons using a simple instrument. One holds the wooden instrument with the hair attached to it, spinning it and moving away, while the other feeds out the required amount of hair from the bulk. Rough, irregular balls of thick yarn (*sughulu*) are made, which are then spun into thread with a cross-wheeled spindle (*duk*). This wheel resembles a plus sign, with a straight rod passing perpendicularly through the crossing and an iron hook attached on the top. Hairs are tied to this hook and pulled upward with one hand, and the wheel is spun with the other hand. The length of the thread spun in a single pull of the hand varies according to where the person doing the spinning is sitting – on the ground or on a raised platform. After each pull, the spun thread is wrapped around the lower part of the instrument. This process is repeated until this section is filled with thread. Round-shaped thread balls are made from the finished spun thread, and then the wheel is readied for further spinning.

<sup>141</sup> Nowadays, *kapol* is a common headgear in Afghanistan and widely sold in the bazaars of Kabul.

<sup>142</sup> Some households in Odier also use a bow for this purpose, but this is not the usual practice followed by everyone.





Source Draft and drawing, Fazlur-Rahman 2003

**Fig. 4.5 Processing of Goats' and Yaks' Hair in Odier Village**

The same procedure for spinning warp and weft threads is followed as in the case of wool. For warp threads, after the hair has been spun on the cross-wheeled spindle, the thin thread is wrapped loosely around two pillars, so that many threads are spanned out between them. Then a small stick is passed through the threads in the middle. With the help of this stick, the hair thread is twisted and very tightly wrapped to make a single thick band and the stick is then prevented from unravelling by propping it against a beam up above. This is left in place for about two weeks, during which period the stick is further tightened once or twice. This is done to relax the spin in the thread and to ease further handling. The resultant thread is once again wound together into balls and is now ready to make into the required items. Similar to the traditions in the Kalash valleys (cf. SPERBER 1996: 391), this warp thread is sometimes also used as an interlacing material in place of *Mazari* (*Nannorrhops ritchiana*) to support the local bedsteads.

Besides being used as warp thread for the coarse domestic rug (*paylesik*), this form of hair is also used for making ropes. Due to the length of its fibres and softness, yak hair

is highly prized for this purpose. In former times, yak-hair ropes were the only available means of fixing transportation loads, both on human backs as well as on beasts of burden. Therefore, the ropes were also taxed by the former state authorities of Chitral. The payment of ropes was collected from the villagers by the *charboo* (the lowest administrative personnel). He then retained one rope as part of his *ishpan*, along with other things (BIDDULPH 1880: 67), and deposited the rest in the state treasury.

The weft thread is spun in the same way as warp thread, except that the different colours are spun separately, and balls of various sizes are made out of them. Mostly this hair is used to weave coarse rugs (*paylesik*), whose usual size is 1.2 by 0.7 metre. The looms are locally made, and weaving is relatively simple, even for a common man, although the assistance of an expert is always needed for the initial set-up of the loom. The loom is movable and can be set up anywhere, without any site specification. Therefore, there are two options for weaving the *paylesik*: either the loom is transported to the customer's house, or the thread-balls are brought to the weaver. This depends partly on the intended design of the rug to be made and the ability of the person in question to weave it on his own. Mostly the *paylesik* are made very simply, without any pattern. For specific designs, however, small pieces of thread from each colour are taken and woven in accordingly. This is not a simple job, and only an expert can weave such beautifully patterned and designed rugs, which also fetch a better price in the local market.

#### 4.3.3.4 Seasonally Fluctuating Prices of Livestock

The sale of livestock is relatively rare in the village. The sale or purchase of any animal is first discussed and decided in the family. Generally speaking, the main consideration behind any livestock transaction is the need for cash to pay off debts and local borrowings, or to cope with an emergency. Other factors involved are ensuring a sufficient availability of animals and their products in the household, at the same time as realistically assessing the available fodder stocks for winter stall-feeding. Generally in the mountainous areas, the prices of livestock species vary according to their productivity, the season and their age (cf. BISHOP 1990: 246). Productivity also varies seasonally – e.g. cows yield at least three times more milk in the summer than in winter, irrespective of their lactation period. But the season of sale is also very important, mainly due to the availability of fodder for stall-feeding.

Cows and oxen are relatively low priced in autumn, even though this season coincides with the traditional slaughtering and winter meat storage, and high priced in spring. This is true although the animals are healthier in the fall and yield more milk and meat (if slaughtered), whereas in the spring they are very weak, with minimum productivity. The sole rationale behind this price fluctuation has to do with the consumption of fodder. In the autumn season, the cattle are relatively cheap because they have not yet consumed the valuable fodder stock. In the spring, they have already consumed the fodder, and thus the value of the fodder is added in and adjusted for in the price. Secondly, the possibility of outdoor grazing and the consequent increase in productivity during the forthcoming season is also anticipated. Age is another very important factor regarding the animal's potential for giving birth to calves and its strength for pulling the plough. The animal's age is also very closely associated with its care and feed

consumption. In the case of sheep, goats and yaks, the price varies a little differently, but to some extent the criteria are the same. These animals are more expensive in autumn when they yield more meat, and relatively cheap in spring.

#### 4.3.4 Socio-Cultural Dimensions of Animal Husbandry

In addition to the symbiotic relationship of animal husbandry and agriculture in providing food for the household, there are different socio-cultural and ritual dimensions of animal husbandry in the mountainous region of northern Pakistan.<sup>143</sup> Animals always were and still are a main source of wealth and prestige for the mountain farmers in the traditional society. Moreover, they are the main source of mutual exchange and reciprocity at the village and neighbourhood levels, as well as between the in-laws. Although, this trend is changing with the current socio-economic transformations, livestock still play the major role in maintaining relationships and the exchange system throughout the whole region.

##### 4.3.4.1 Exchange of Livestock in the Village

Animals are needed for agricultural activities such as ploughing, threshing, and transporting loads from place to place within the village. Since most of the households do not have enough animals to fulfil all their needs, the villagers commonly practise seasonal and temporary lending and borrowing of oxen, donkeys, and threshing teams, without any payment. The system of reciprocal animal exchange between the in-laws is different, however, and is based on the traditional practices and customary laws. This tradition is part of the old *Khow* culture that persisted for centuries in the country and was later on adopted by the local rulers. The historical sources report that in the past this bilateral exchange of animals between the in-laws was always relatively stronger in the absence of cash. According to SCHOMBERG (1938: 232):

*"In the Atrak or Ataq valley of the Turikho district [Sic!] these customs are varied. There the bridegroom gives his future father-in-law one gun, three or four bullocks, up to twenty, as he can afford. When the girl joins her husband she brings ten goats or sheep for each bullocks up to twenty, or even up to thirty, according to her means. In this district more comes from the bride's side than from the bridegroom's."*<sup>144</sup>

Similar to the prevailing cultural patterns of in-laws exchanging animals and other items in Yasin Valley (HERBERS 2000a: 203f.), the exchange pattern in Odier can be termed 'quid pro quo'. The normal pattern of exchange between the in-laws is predetermined, fixed according to past practice, and is called *phul*. *Phul* refers to the back and forth flow of gifts and goods that are being exchanged, in both directions, by both sets of in-laws. The relatives of the bride will commonly demand some items, such as a bull or specific brands and models of guns; and in return many other items are given as gifts

<sup>143</sup> In this context, the socio-cultural, political and religious significance of goat keeping in the Kalash valleys of southwestern Chitral (cf. ROBERTSON 1896 and PARKES 1987, 1992) should be considered an exceptional case. The animal husbandry system in the Kalash valleys is quite unique compared to other parts of High Asia.

<sup>144</sup> For more details on the exchange system and ceremonial importance of livestock, see also STELLRECHT (1980: 185ff.) and ASEER (1996).

to the relatives of the bridegrooms on different occasions. This exchange or reciprocity coming from the bride's side of the family is considered to be the reciprocal *phul* for the gifts and demanded items that they have received. In certain cases, other materials are also received and animals are returned in reciprocity. The nature and form of bilateral exchange differs between the two sets of in-laws. The in-laws from the bride's side of the family, in particular, the household head's wife or daughter-in-law, generally give such presents as bedding, cows, or cooking pots.<sup>145</sup> Each of these items is considered a single unit in the *phul* exchange. The reciprocal *phul* that is paid is sometimes worth more than the prevailing market price of the original gifts.<sup>146</sup> A gun, for example, depending on the type and brand, is about ten times as expensive as bedding. The granting of cooking utensils, sheep and goats that is given to the daughters on different occasions are not compensated for in the traditional exchange process. Likewise, monetary or other contributions from the son-in-law are not considered part of *phul*.

This process of reciprocal exchange between in-laws takes its normal form in an amicable bilateral relation between the in-laws. In the case of any litigation leading to divorce, the whole list of exchange items, including money etc., right from the beginning of the marriage up to that day, are recounted by both parties and presented to the arbitrating council or court. In the final settlement, all items that have not yet received their reciprocal *phul*, on both sides (the bride's and groom's), are counted and converted into monetary units according to the existing market prices, and the problem is resolved by both sides making the necessary payments to even things up. The form of settlement also depends on the nature of the case, i.e. which spouse, husband or wife, is pleading for divorce (cf. BAIG 1997: 132).<sup>147</sup>

#### 4.3.4.2 Breed Improvement Methods and Seasonal Borrowing of Milk Cows

There are two different systems of seasonal borrowing of animals, that serve both as traditional risk management in animal husbandry as well as breeding improvement at

<sup>145</sup> Special old cooking pots known *chidin*, which in the past used to be manufactured from lead in Badakhshan, are also considered an exchange item for reciprocity between the in-laws. Although these are no longer available in the market and are thus very rare in the village, they were part of the old exchange system. At present, such pots are used for cooking some traditional dishes, and very few households possess them. See also BAIG (1996: 143) for information on the forceful confiscation of these pots by the state authorities for making weapons.

<sup>146</sup> In the past, Springfield-type guns were popular for this exchange. Later on, new guns came in, and after the Russian invasion of Afghanistan in 1979, the 12-bore Russian-made shotguns became very popular in this exchange system. Up until the 1990s, the cost of a single Russian-made gun was between five to eight thousand Rupees. But the most valued gun was the Czechoslovakian 22-bore shotgun, popularly known as *cheko bayes bor*. Its price was between Rs. 8,000 to 15,000. But at present, this tradition has thoroughly changed. Today nobody is allowed to keep or exchange guns openly, due to the de-weaponisation process started by the present military government of General Pavez Musharaf.

<sup>147</sup> An arbitrating committee, nominated by the concerned parties and headed by the village priest (*qazi*), settles most of these cases within the village. Only a few cases of this nature reach the local courts. Since marriage ties are religious contracts in this society, after an initial hearing the local courts send these cases back to the village priest for final settlement.

the household level. In certain cases, when a milk cow is not available in a house during the summer season, the household can borrow one from its relatives for the whole summer season.<sup>148</sup> This is locally called *dogh*. This is practised between the relatives with the consent of the families. In this system, the borrower pays the owner nothing and keeps the milk cow for the whole summer season.

The second possibility arises when a household has either lost its livestock as a result of a catastrophe, disease etc., or it simply wants to improve the breed stock, or else it is otherwise planning to start rearing a new livestock species. In this case, the household can borrow one female cow, goat or yak for a period of three or more years, culminating in the birth of a baby animal. This system is called *zhawook*. The method of adopting this system differs depending on the animal species. In matters of sheep, goats and cows, women make the arrangements, based on arriving at a mutual understanding with the relevant neighbours or relatives, and in the case of a cow, her family must also agree. But in the case of yak, the man usually makes the decision; and although the matter is discussed in the house, the family's consent is not necessary. This practice is not restricted to close relatives and neighbours, but it is sometimes carried out with people from outside the village. Normally the period of a *zhawook* is fixed, and at the end the animal is returned to its owner. In the case of a late birth, the agreed-upon period is extended. If the offspring is male, the newborn will usually be exchanged, and a new attempt will be made. At the end of the prescribed period, on the occasion of handing the animal over to its actual owner, some gifts are also presented. This gift is called *zhavookla*. In the case of a cow or yak, the gift is usually a traditional *shuqa*.

#### 4.4 Off-Farm Sources of Income and Sale of Domestic Handicrafts

As is usual in traditional livelihood strategies, both agriculture and animal husbandry are subsistence oriented, and most of the domestic needs are fulfilled from household production. When people are not self-sufficient for their agricultural products, the deficiencies are made up for mostly through bartering with the neighbouring villages. With the increasing accessibility of the North Areas, and the resultant incursion of a monetary economy, however, the barter tradition began to weaken. The inhabitants started needing cash to buy domestic provisions, and had to figure out ways of earning cash income outside of their villages (cf. Chap. 5.5.1). Due to its remote location (cf. Chap. 2.1.1) and the prevailing socio-cultural environment, the access to off-farm income sources was very limited in Mehlp Valley until the late 1970s. Since then, the situation has improved and the households from the valley have taken advantage of the new opportunities for earning cash income.

Previous to the 1960s, the only valuable local product for market exchange in the whole Chitral including Mehlp Valley was *Cannabis stiva* (*chars*). This used to be one of the main sources of state income, and the trade route via Chitral was one of the main narcotics transaction points (cf. ISRAR-UD-DIN 1965; HASERODT 1989a and KREUTZMANN 1998a, 1998c). This crop was suited to the extreme environmental conditions and

<sup>148</sup> Similar traditional practices have been reported in Yasin Valley, as well (STÖBER & HERBERS 2000: 42).

yielded the highest return, compared to all other crops. It had a good market value and was in high demand both within and outside of the princely state. Therefore, it was cultivated throughout the Chitral state particularly in the high-altitude villages. The local handicrafts, mainly woollen cloth and robes, were another source of cash income. Usually most of the valley households visited the regional centre, 'Chitral bazaar', in the autumn to sell their handicrafts and purchase domestic necessities for the whole year. All other transactions were conducted in barter. Regular seasonal migration to the lowlands from this village, especially to PESHAWAR, started after the 1950s.

Since then, development work in the state has provided some opportunities for earning cash. Likewise newly introduced reforms have resulted in more job possibilities. For instance, the restrictions for recruitment into the local police and Chitral Scouts, which was previously exclusively reserved for higher-status families, were relaxed. Nevertheless, relatively few persons from the village were employed in the state services. Odier's participation in the seasonal labour migration was also limited. This increased substantially after the abolition of local rule and the boom in the construction industry in the late 1960s and early '70s (cf. STALEY 1969). The insufficiency of food in the whole Torkhow tahsil remained critical until the 1970s. This was due to low productivity and difficult communication systems in the district. According to EGGERT (1990: 23)

*„Es gab 1973/74 in Moolkho und Turkho auch keine Läden, in denen Lebensmittel und Gebrauchsgüter zu kaufen gewesen wären. Die Bewohner erzeugten das meiste von dem, was sie brauchten, selbst, und was sie kaufen mußten, kaufen sie entweder in Chitral /Ort oder bei ambulanten Händlern.“*

The establishment of small shops in the village that offered very limited food items and the availability of subsidised food further necessitated a cash income. Aside from seasonal migration to the lowlands, donkey carriage of goods from Chitral centre to the villages and working in the state services were the main sources of income. The real impacts of seasonal out-migration on agriculture and animal husbandry were felt after the village's accessibility increased, with the resultant availability of food items and other household goods in the local market. It was only in the late 1980s that both the contribution of cash income in the domestic economy and participation of households in the seasonal migration drastically increased (cf. Chap. 5.5.2.2).

#### **4.5 Seasonal Movement Within the Village**

As is usual in most of the mountainous regions, land resources in Odier Village are vertically distributed in an altitudinal range from 2,600 to 4,000 m a.s.l. This is true for the resources in both individual and communal ownership regimes, with the latter occupying the highest altitudes. Individual ownership resulted due to systematic development of the barren land in the surroundings of the village. However, the vertical extension of arable land is restricted to up to 3,200 m. With a few exceptions, all the households have their arable land at three or four different locations between 2,800 to 3,200 m (cf. Chap. 3.2.1).<sup>149</sup>

<sup>149</sup> Excluding the emigrants, only a very few households had the chance to sell their land in the summer settlements and purchase arable land in the proximity of their winter houses. This

To maximise the use of all resources at different niches, as well as to save some of them for winter season, the villagers have established summerhouses at different locations, according to the availability of arable land. This enables them to be close to their land, and they can store some amount of manure there, in the summer settlement, for application to the nearby fields. Likewise, they can set aside grass and fuel wood in the winter houses, at relatively lower elevations, to be stockpiled and consumed during the winter season. Although it is labour intensive to move to the summer settlements and carry out most of the agricultural activities from there, there is no better alternative. Without changing residences, the high pastures could not be systematically and appropriately utilised, because of the snow cover in winter and the long distance up-and-down movement in autumn and spring; nor could the highly valued and scarce resources (firewood and fodder) be saved as stocks in the winter settlements. Additionally without shifting to the high-altitude settlements, the travel time to the pastures would remain higher and the grazing period shorter.<sup>150</sup> Thus, this short-distance seasonal movement to high-altitude houses in summer and lower ones in the winter season is one of the villagers' most advantageous strategies to utilise spatially remote and seasonally productive resources rationally. The pattern of movement that has resulted has short- and long-term economic benefits for all the households of the village.

Besides this collective movement from the lower houses to the summer settlements by the majority of households, some also practice a systematic movement in individual

**Tab. 4.2 Clan-based House ownership in Odier 2001**

| Clans        | Households with a single house | Households with two houses | Households with three houses | Total households  |
|--------------|--------------------------------|----------------------------|------------------------------|-------------------|
| Bulay        | 8                              | 19                         | 4                            | 31                |
| Khushay      | 3                              | 0                          | 0                            | 3                 |
| Nasketek     | 1                              | 6                          | 3                            | 10                |
| Shadeyay     | 2                              | 3*                         | 0                            | 5                 |
| Shaipay      | 5                              | 7                          | 4                            | 16                |
| Somalay      | 2                              | 50                         | 3                            | 55                |
| <b>Total</b> | <b>21 (17.5%)</b>              | <b>85 (70.8%)</b>          | <b>14 (11.7%)</b>            | <b>120 (100%)</b> |

\* Not within the territorial limits of the village  
Source Author's own survey, 2001

had some disadvantages, as they no longer had easy access to some of their resources, and such households became more vulnerable to seasonal shocks and crop failure. On the other hand, the disintegration of extended families and availability of land in the local market also favoured the spreading of land parcels belonging to a household throughout the whole village. Thus, in the future it is expected that more fragmentation of arable land at each location will occur in the village.

<sup>150</sup> The time needed to cover the distance back and forth from the high-altitude residences to the pastures for grazing in the summer season is about 2.5 hours, with a maximum outdoor grazing period of about eight hours, from 8 o'clock in the morning to 16 o'clock in the evening. During the winter season, the maximum grazing time varies between 5.5 to 6 hours, excluding the one-hour travel time from the dwellings to the nearby pastures.

capacity within the village throughout the year. These households usually follow a sequential pattern for occupying their residences at different altitudes. As is common in Torkhow and Mulkhow tahsils (cf. ISRAR-UD-DIN 1966 and EGGERT 1990: 26), most of the households in this village have two houses, and some even have three (Tab. 4.2). The distance between the houses ranges from ca. two kilometres to a few hundred meters. Thus, similar to the situation in other villages of Mehlp Valley (cf. App. 5), the majority of households in this village are mobile (more than 80 percent), and this is one of the principal strategies adopted to mitigate the resource scarcity in any one location.

#### 4.5.1 Collective Occupation of Summer Settlements

The collective occupation of summer settlements in the village comes into effect in June. According to the prevailing weather conditions, the village elders fix the exact date of the move, which generally varies from the 1<sup>st</sup> to the 15<sup>th</sup> of June. All the villagers are informed, and it is obligatory for them to shift their sheep and goats on that day from the lower part of the village. On the following day, the main animal passageways are declared closed in the lower part of the village, and nobody is allowed to use them to drive their sheep and goats. However, the households can keep their milk cows wherever they like, and are allowed to graze them on their own private pastures as long as they wish.<sup>151</sup> The turn-grazing system is also suspended in the lower part of the village, and a new one is immediately started on the following day in the upper part, as well as in the main summer settlement (Romolasht) (cf. Chap. 4.3.2.5).

Odier village has its summer settlements at four different locations, and all of them are with arable land and cultivation (cf. Chap. 3.2.1). The upper part of the village is basically a winter settlement and only eight households have summer settlements there.

<sup>151</sup> This is contrary to the restrictions imposed in other parts of the Northern Areas of Pakistan, such as Shigar (cf. SCHMIDT 2000a) and Astor (cf. NÜSSER & CLEMENS 1996 and FAZLUR-RAHMAN 2000). In these areas, nobody is allowed to graze his own animals on his private land after shifting to the summer settlements.



**Tab. 4.3 Seasonal Movements of the Households in Odier**

| From the winter settlements | To the summer settlements | Number of household | Percent    |
|-----------------------------|---------------------------|---------------------|------------|
| Lower Odier                 | Romolasht                 | 25                  | 20.8       |
| -do-                        | Upper Odier               | 8                   | 6.7        |
| -do-                        | Nashtani                  | 8                   | 6.7        |
| -do-                        | Lashtodok                 | 3                   | 2.5        |
| Upper Odier                 | Romolasht                 | 28                  | 23.3       |
| -do-                        | Nashtani                  | 17                  | 14.2       |
| -do-                        | Upper Odier (within)      | 4                   | 3.3        |
| -do-                        | Lashtodok                 | 1                   | 0.8        |
| Odier                       | Shoat                     | 3                   | 2.5        |
| No movement*                | -                         | 23                  | 19.2       |
| <b>Total</b>                |                           | <b>120</b>          | <b>100</b> |

\* Except eight households all others residing in one house for the whole year have land in more than one location.  
 Source Author's own survey, 2001

There are four households whose seasonal movement is only within the upper part of the village, i.e. they have two houses in this part of the village (Tab. 4.3). The duration spent at the summer settlement is not fixed, and depends on the individual household. However, it generally varies from three to four months, i.e. the main growing season of crops and grasses, from June till the end of September. Some households, however, spend only one month there and a few stay even longer than four months. The latter do not own enough arable land and private pastures in the permanent settlements to grazing their milk cows. This trend of overstaying usually leads to the construction of additional facilities in the summer settlement, such as better houses, guest rooms toilets, etc.; and such developments are clear indicators of permanent occupation in the near future.<sup>152</sup>

All farming activities are carried out from the summerhouses. During the whole season, most of the household members are continuously touring between the two locations daily, for a variety of agricultural pursuits. The male household members visit the winter settlements during the daytime to perform daily agricultural tasks and return to the summer settlements only in the evening. Children and female household members supply food and other necessities from the summerhouses. Naturally, this causes a lot of pressure on the available labour force in the household, and to reduce the daily travelling, a few households split temporarily into two groups, and occupy both their houses simultaneously.<sup>153</sup> This practice is difficult to maintain, however, because it requires more labour and resources to run two households. Moreover, it also goes against the general philosophy of seasonal movement. Therefore, very few households (only

<sup>152</sup> Quite similar patterns of overstaying and establishing permanent occupation of summer settlements have been reported from Puniyal and Yasin valleys in the Northern Areas of Pakistan (cf. FISCHER 2000a: 64 and STÖBER & HERBERS 2000: 55).

<sup>153</sup> Similar practices have been reported from the Rupal Valley, as well (cf. NÜSSER & CLEMENS 1996: 126).

three in the whole village) are actually practising this newly introduced method. At the termination of the growing season, in the beginning of October, most households shift to their winter houses. Of the total households, 65 move down to the lower part of the village and 55 remain in the upper part. They then remain in their respective sections for most of the winter season.

#### 4.5.2 Movement during the Winter Season

During the summer season, most of the products collected in the summer settlement, such as fodder and fuel wood, are transported to the winter houses for storage and consumption. Many households stockpile these products in their seasonal summerhouses, as well. This means that stores are deposited in both the upper and lower parts of the village, which serve as the winter/summer settlements for these households (cf. Chap. 4.5.1). The villagers then have the option of visiting these different houses in the winter, and sometimes stay there for one or two months, depending on the fodder stocks and availability of firewood. Households that have no houses close to their arable land, or who are for some reason unable to occupy their houses at that particular location, either trade their fodder with others in exchange for manure, or transport the fodder and firewood stores from the summer residence to their winter houses.<sup>154</sup>

Very few households (only seven in the village) participate in this secondary movement. After shifting to the lower part of the village in early autumn, they return to their houses in the upper part in December for two to three months. They again shift to the lower part of the village in February or March, and remain there until the village shifts collectively to the summer settlements (cf. Fig. 4.3). This movement fulfils several purposes: it allows them to consume the fodder and firewood in both residences; it ensures the availability of manure for the arable land in both locations; and it lets them avail themselves of the relatively better access from the lower part of the village to the nearby pastures in spring (cf. Chap. 3.4.4.1). Meanwhile, households having three houses first occupy the highest-level summer settlements in the first stage; in the autumn they shift to the intermediate-level houses; and finally, with the approach of winter they move to their lowest dwellings, mainly in the lower part of the village.

Although many inconveniences are associated with this continuous shifting of residences, especially in the winter season, it is nevertheless said to be one of the villagers' best strategies to avoid a lot of labour-intensive activities. When a household resides at one location only, they have to transport most products that are produced and collected at other locations – such as firewood and fodder, as well as manure – back to that house. This is much more labour intensive than the seasonal shifting to houses at different locations. To make use of the fodder stores in the upper part of the village and to lay down a store of manure, the households usually keep an ox or donkey there, even while they are living in their winter house. In this case, the male household members are responsible for tending these animals. They make daily trips up to the upper houses and

<sup>154</sup> Both winter-season movements to the summer settlement for the consumption of fodder stock, as well as exchange of fodder with neighbours and relatives, have been reported from the Naga Parbat region, North West Himalaya (CLEMENS & NÜSSER 1996, 1997, 2000 and NÜSSER & CLEMENS 1996).

spend the whole day there, taking care of the animals, performing other winter tasks, and generally enjoying social time together with the other men.

About 21 households have only a single house in the village, and are not participating in the village-level seasonal movements. However, they also shift their sheep and goats (if any) from the lower part of the village, even though they remain in the same house for the whole year. Although some of these households do not have land in the summer settlements (cf. Chap. 3.2.5), most of them have land there, but due to shortage of labour force, they remain in their winter houses all year round. Anyhow, they cultivate their arable land in other locations on their own, and do not employ any tenants.

Three households of the Shadestay clan still have houses and own arable land in one of the neighbouring villages (Shoat). Since they have no land in the Odier summer settlements, two households move to Shoat village in the summer, and one moves there in the winter season. They are considered regular households in both villages, and thus have access to the common property resources of both Odier and Shoat villages simultaneously. It is actually their physical presence that enables them to get access to the common property resources, rather than the location of their arable land. It is thus expected that they will maintain this dual membership and their dual access rights, through participating in the village activities as a regular household in both villages (cf. Chap. 3.4.2)

#### **4.6 Levels of Cooperation and Reciprocities**

As is clear from the above discussions (cf. Chap. 4.2, 4.3 & 4.5), the subsistence economy of this village utilises a wide range of multilateral and bilateral co-operations and reciprocities in a highly interdependent socio-economic situation. Without these appropriate mechanisms, not only would the survival of the whole community be at stake, but also the long-term sustainable management of natural resources and village infrastructure maintenance would be obviously impossible (see below). Well-established reciprocal systems among the co-owners of common property systems (cf. NETTING 1976; BERKES 1989; GADGIL & IYER 1989; GADGIL & BERKES 1991 and BHATIA 1997) are crucial for the resiliency of the resource management system, at the community as well as village levels (cf. Chap. 3.3). The organisation and operation of mutual help on the household, clan and village levels ensure the common interests of all households and, at the same time, provide subsistence sustenance to the individual members of the village community. According to the Sustainable Livelihoods Guidance Sheet 2.3.2 (c.f. DEPARTMENT FOR INTERNATIONAL DEVELOPMENT 1999), these co-operative practices and reciprocity activities are treated as an important part of the Social Capital of a community.<sup>155</sup> Moreover, for the accumulation of other forms of capital at household, local and national levels, especially among the traditionally marginalised groups, Social Capital plays a significant role in developing efficiency and equity among

<sup>155</sup> According to the Sustainable Livelihood Guidance Sheet, chapter 2.1, livelihood assets have been divided into five capitals, namely: Human Capital [knowledge and expertise of population], Natural Capital [natural resources], Financial Capital [money], Physical Capital [basic infrastructures] and Social Capital [local organisations, mutual cooperation and reciprocities etc.].

the members of the community (COLEMAN (1988); BEBBINGTON & KOPP 1998 and PRETTY 2003).<sup>156</sup>

#### 4.6.1 Organisation and Exchange of Labour at Various Levels

The exchange of labour and other reciprocal activities are among the most important components of subsistence livelihood strategies in the mountainous regions throughout the world.<sup>157</sup> Similar to the practices in the Andes and Himalayas (cf. GUILLET 1980: 164 and STEVENS 1993: 423), despite considerable socio-economic changes, the labour exchange and reciprocity relations are still persisting in Mehlp Valley. Based on his work in the Central Andes, GUILLET (1980: 154, Tab. 1) identified the following patterns of labour recruitment:

|             |  |
|-------------|--|
| Familial    | Obligation to participate is based on ascribed kinship or fictive kinship status in a household.   |
| Contractual | Exchange of one's labour for cash or the equivalent in kind.                                       |
| Reciprocal  | [Includes]   |
| Exchange    | Day paid for day worked: "balanced exchange".  |
| Festive     | Festive work party with no immediate expectation of reciprocity.                                   |
| Custodial   | Obligation to participate is based on differential ascribed power. Sanctions compel participation. |

In Odier, labour exchange for the performance of domestic and communal activities is traditionally organised in three different ways, i.e. *yardoyee*, *moan* and *hoyou*. *Yardoyee* is helping out without reciprocity, usually in exchange for food and drink during the job; *moan* is an obligatory fulfilment of a responsibility, with a fine levied for non-participation or non-appearance; *hoyou* is a voluntary reciprocal agreement between two households. Compared to the classification of David GUILLET (1980), *moan* is equivalent to the 'custodial' category of exchange, but no parallels for the *yardoyee* and *hoyou* systems of labour exchange were found in the Central Andes. Moreover, in Odier Village as well as Mehlp Valley as a whole, not only labour, but also other activities and communal responsibilities are carried out under the umbrella of these three well-established labour exchange principles (Tab. 4.4).

The salient features of labour recruitment for domestic agro-pastoral activities in Mehlp Valley, as well as communal labour mobilisation and exchange procedures at the village/group levels are briefly described below.

*Yardoyee* is the most frequent form of labour recruitment in all villages of Mehlp Valley and is still practised to a great extent. It is a household-level arrangement of labour

<sup>156</sup> More information on Social Capital and its relevance to livelihood security in the developing countries of the third world can be found in BOHLE (2001) and TRÖGER (2002 & 2003).

<sup>157</sup> For further details on different aspects of reciprocal and cooperative activities see MOORE (1975); NETTING (1976); THOMAS (1979); GUILLET (1980, 1981, 1983); MESSERSCHMIDT (1981); ORLOVE & GUILLET (1985); MIAN (1986); BISHOP (1990: 186ff.); STONE, NETTING & STONE (1990); GUPTA & URA (1992); FAIZI (1996b: 74f., 1999); SÖKEFELD (1997: 82f.); JANJUA (1998); MACDONALD (1998) and STÖBER (2001: 53ff.).

for agro-pastoral activities. Similar to the practice in Yasin Valley (STÖBER 2001: 55), in most cases the helper does not expect any reciprocity. A household can request its relatives, neighbours or fellow villagers for help in labour stress situations, and is then obliged to provide food and drink to the helpers (*yardoyou*). *Yardoyee* is organised for a wide range of activities, depending on the labour availability within a household. Mostly harvesting of crops, *moshin* and grass cutting are carried out with this system. Usually no direct payment is made to the *yardoyou*.<sup>158</sup> Quite often, a household will also use a *yardoyee* arrangement in order to ensure that its *moan* or *hoyou* responsibilities are fulfilled. In most cases, an ox, threshing team or pack animal is also borrowed from relatives, neighbours and fellow villagers, following the same principles of *yardoyee*. In this case, no reciprocity is expected, but the animals are fed.

In the *moan* category, the contribution of labour or an item (depending on the situation) is obligatory for the concerned households, according to the level of organisation. *Moan* is a fixed contribution of labour, or in some cases an item, and equity is maintained to a certain extent. Most of the important activities in this valley, such as maintenance of infrastructures, the burial system and turn grazing of sheep and goats, are conducted under this system of labour arrangements. The actual functioning of the system varies from activity to activity. For instance, grazing the goat and sheep is a *moan* obligation of each single household (cf. Chap. 4.3.2.5) within a turn-grazing organisation, during the period of its turn; whereas bringing a stone slab to cover the grave was a *moan* at the clan level (cf. Chap. 4.6.5.1). In the case of *moan*, strict control is maintained to make sure the contribution of labour or the concerned item is provided according to the group agreement. Likewise, depending on the nature of the work and number of households responsible, non-contributors are punished – for example, in the case of channel maintenance, through the imposition of a fine (cf. Chap. 3.3.4.2).

In the case of *hoyou*, the system of labour sharing is carried out between two households and is based on mutual consensus and verbal agreement. *Hoyou* is established for the performance of different activities and, according to the nature of the contract, the reciprocation is always *quid pro quo*, i.e. work is reciprocated for work, and animal for animal. Any two households may establish this system at any time of the year, and maintain it for an unlimited period of time. For the concerned households, reciprocity for *hoyou* activity is considered a duty, equal to *moan*.

<sup>158</sup> Although there is no direct cash payment to a *yardoyou*, the interdependencies among the households are so complex, that at any time the contributor is indirectly compensated through the provision of fuel wood, fodder, seed, draught power, credit etc. There are well-established bilateral relations among the households.

Tab. 4.4 Labour Exchange and Other Reciprocities in Odier

| Activities   | Labour Exchange Systems |                 |              |   |
|--|-------------------------|-----------------|--------------|---|
|  | <i>Moan</i>             | <i>Yardoyee</i> | <i>Hoyou</i> | <i>Level / Nature</i>                     |
| Turn grazing of sheep and goats  | X                       |                 |              | Group                                     |
| For performing turn grazing  |                         |                 | X            | Two households                            |
| -do-   |                         | X               |              | Without reciprocity                       |
| House construction   |                         | X               |              | With reciprocity                          |
| Channel maintenance  | X                       |                 |              | Group                                     |
| Road or bridge maintenance   | X                       |                 |              | -do-                                      |
| Burial system all activities   | X                       |                 |              | Village/clan                              |
| Watermill maintenance  | X                       |                 |              | Clan                                      |
| Wood contribution for mosques  | X                       |                 |              | Neighbourhood                             |
| Help in agricultural activities (sowing, harvesting, taking manure out etc.) |                         | X               |              | Without reciprocity                       |
| Plough team and pack animals   |                         |                 | X            | Two households                            |
| -do-   |                         | X               |              | On prior request                          |
| Threshing team   |                         |                 | X            | Two households                            |
| -do-   |                         | X               |              | On prior request                          |
| <i>Pandar</i> (contributions for the groom at the time of marriage)          | X                       |                 |              | Relatives, excluding the expected in-laws |
| <i>Chighich</i> (contributions for the bride at the time of marriage)        | X                       |                 |              | -do-                                      |
| Harvesting food and fodder crops   |                         |                 | X            | Neighbours (not regularly practiced)      |
| Taking manure to the fields  |                         |                 | X            | -do-                                      |

Source Author's own survey, 2001

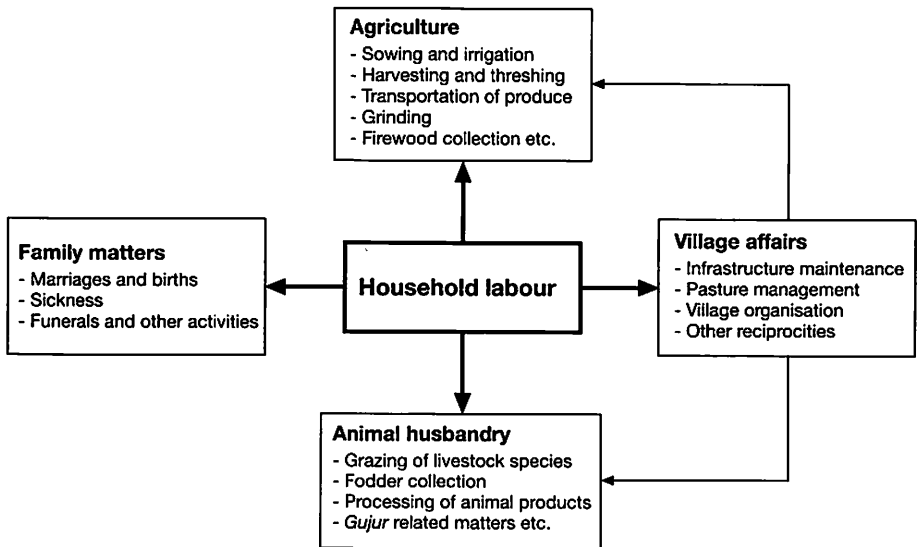
However, it is different from *yardoyee* and *moan*, because in *yardoyee*, with a few exceptions, reciprocity is not always expected, and in *moan*, there is very limited possibility of abstaining from the prescribed contribution of labour in any communal activity. Moreover, compared to *moan*, *hoyou* can be abolished at any time.<sup>159</sup> *Hoyou* is usually established for carrying out rotational-based turn grazing of sheep and goats and ploughing. In the former case, each household agrees to provide an able-bodied male for the turn of his partner, and in the latter case, an ox for ploughing. Households co-operating in a *hoyou* system for ploughing always consult each other before lending one or both oxen to a third person. They also co-ordinate their ploughing schedules, to

<sup>159</sup> There is a saying in the local language (Khowar): "The death of a bull causes the end of *hoyou*-related arrangements between the concerned parties." This expression is usually asserted by the in-laws on the female side as justification for terminating the in-law relationship upon the death of their daughter or sister.

#### 4.6.2 Gender Division of Labour at Household Level

Gender division of labour is a common phenomenon in the northern mountainous belt of Pakistan, from Karakoram in the east through the Himalayas and Hindu Kush in the far west, and Mehlp Valley is no exception to this general trend. The gender-specific duties and obligations are usually rooted in socio-economic needs, traditions, customs, and the environmental perception of the communities. However, the allocation of work, working domains and general perception of the environment vary among the communities throughout the Hindu Kush Himalayan and Karakorum region.<sup>160</sup>

In Odier, in general a household is not only the main unit of socio-economic organisation, but is also accountable for carrying out a variety of related duties and responsibilities at different levels. For every task, a labour force needs to be organised from the available persons in the household (Fig. 4.6). The number, composition and age of the household members is thus an important factor in the allocation of responsibilities. These responsibilities are subject to change, both seasonally throughout the year and spatially within the territorial limits of the village (STREEFLAND, KHAN & LIESHOUT 1995; MILLS 1996 and HERBERS 1997). During the growing season, the household head works out daily plans in the evening and, after discussion, the relevant tasks are distributed among the household members. If a household has a shortage of available hands and skills, neighbours and relatives are approached for assistance.



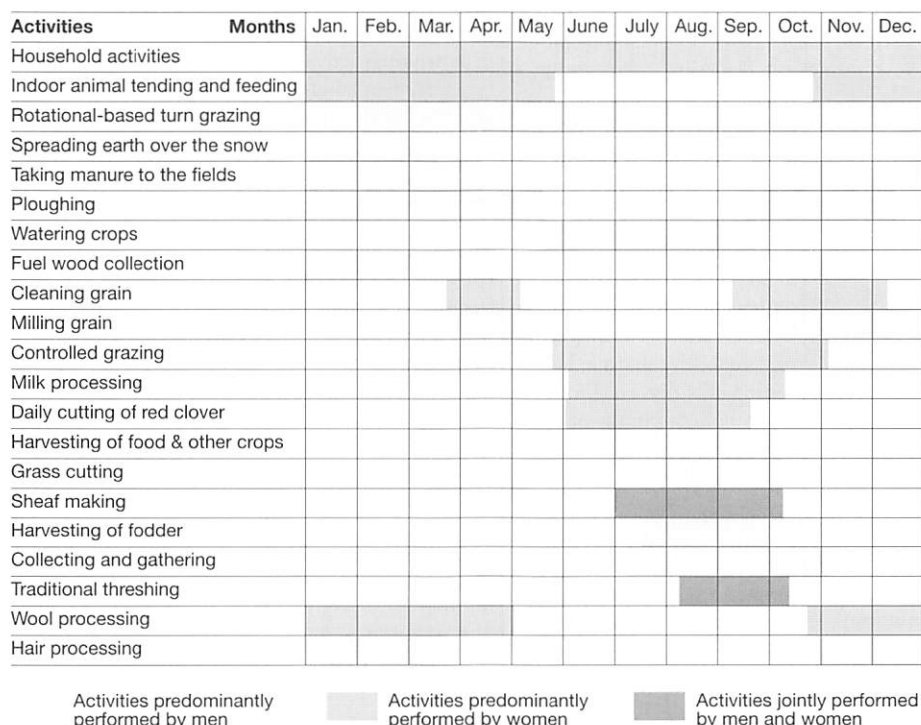
Source Draft and drawing, Fazlur-Rahman 2003

**Fig. 4.6 Households' Labour Allocation System in Odier**

<sup>160</sup> There are regional variations in gender-specific activities in the different parts of the northern mountainous belt of Pakistan. In some cases there is very strict division of male and female labour and domain, and both vary from valley to valley. For more details see; BARTH (1956a); PARKES (1987); HEWITT (1989); KREUTZMANN (1993b, 2000a); MILLS (1996); FELMY (1997); HERBERS (1997, 1998, 2000b); AZHER-HEWITT (1999) and HALVORSON (2002).

This is usually done a few days ahead of time, keeping in mind the rotational turn systems, such as irrigation and sheep and goat grazing.

There is a high level of co-operation and co-ordination at the household level; nevertheless, there are some gender-specific activities as well. Most of the agricultural work – i.e., ploughing, harvesting, collecting fodder and firewood, and transporting all the produce – is carried out by the male household members. In most of these activities, the females usually extend their help in a variety of ways (cf. Fig. 4.7). The women, on the other hand, with a few exceptions, predominantly perform all activities related to tending the animals, food, and other domestic chores. Children also contribute their share in most of these activities. In general, there is a high degree of seasonal fluctuation in the individuals' workload (Tab. 4.5). On the average, however, women work more than the men throughout the year, not only in this village but also throughout the whole Northern Areas of Pakistan (cf. HEWITT 1989; WORLD BANK 1995: 25; MILLS 1996 and HERBERS 1997, 2000b).



Source Draft and drawing, Fazlur-Rahman 2003

**Fig. 4.7 Odier: Monthly Pattern of Gender Work Profile**



**Tab. 4.5 Monthly Patterns of Gender and Children Work in Odier** <sup>161</sup>

| Seasons           | Male work  | Female work   | Children work   |
|-------------------|--|---|---|
| Winter<br>Dec-Feb | Carding/spinning of goats and yak hair; making rugs; performing rotational-based grazing turns; removing snow from the nearby areas of the house; putting earth on the snow; removing snow from the roofs; cutting willow branches for sheep and goats.  | Household work; carding spinning of wool; making woollen socks and pullovers; sewing the woollen gown ( <i>shuqa</i> ).   | Driving goats daily to hand them over to the turn grazier in the morning and receive them back in the evening; help with childcare and other domestic chores.               |
| Spring<br>Mar-May | Field preparation; transporting manure to the fields, sowing of barley, spring wheat, maize and potatoes; first watering of cereal crops; collection of artemisia and other bushes from the pasture; repairing irrigation channels; shearing of sheep, goats and yaks; cutting/collection of firewood from irrigated plantations; visiting the village blacksmith; and milling of grain for the summer season. | Controlled daily grazing of cattle in the vicinity of house; sorting and storing of wool; helping male member in agricultural activities; cleaning grain for grinding; storing flour. | Out-door grazing of sheep and weak animals; bringing artemisia from the pasture for fuel; taking meal and water to the household members working from the residential house |
| Summer<br>Jun-Aug | Second watering of crops; shifting household belongings and flour to the summer settlement; driving the non-lactating animals to the high pasture for free grazing; harvesting of barley, <i>moshin</i> and other fodder from the pasture areas, irrigating maize; preparation for threshing.  | Milk processing; controlled grazing of lactating cows and weak animals close to the houses; helping male household members in farming activities.                                     | Collection of fodder and dung from the pastures.  |
| Autumn<br>Sep-Nov | Harvesting of wheat, maize, potato, grass and collection of lucerne from the summer settlements and far off fields to the winter houses; threshing of barley and wheat; making baskets from willow branches; milling grain; cutting fuel wood from the irrigated plantations.  | Controlled grazing of cattle; helping in farming activities; cleaning grain for milling; flour storing; wool processing; making of socks and pullovers etc.                           | Bringing fuel wood from the pastures and helping in milling grain.  |

Source Author's own survey, 2001

<sup>161</sup> Most of the activities are carried out jointly by all the three actors – male, female and children. But the actual contribution varies substantially according to the activity, position of the household member in the family and household size. At the same time there are some activities, which are exclusively assigned to each of them.

### 4.6.3 Cooperation at Neighbourhood Level

Co-operation at the neighbourhood level is vital for the day-to-day functioning of the whole system. In traditional societies, the relationship with neighbours and a sense of neighbourliness have both socio-economic and cultural importance, and play an important role in everyday life (ISRAR-UD-DIN 1966; BHATIA 1997; HOLDSCHLAG 2000: 134f. and MEYER 2000). As has been stated already, each clan has its own residential quarters in this village; however, due to the seasonal movements, there are temporary changes in neighbours and the composition of neighbourhoods. In most cases, the winter-season neighbours are different from the summer ones, and thus, mutual co-operation and reciprocal responsibilities at the neighbourhood level usually exceed the normal clan boundaries. The village is more or less endogamous, and more than 55 per cent of the households have married within the village. In general, there is a high degree of interaction at this lowest level of social organisation. The mosque-attending groups at the neighbourhood level are also multi-clan, and the obligatory attendance at the five congregational prayers at the neighbourhood mosques and the Friday congregation in the village's central mosque provide excellent opportunities for interaction of the whole community, mutual consultation and village-level conflict resolution.

#### 4.6.3.1 Social and Economic Cooperation

There is a wide range of co-operations practised at the neighbourhood level, from arranging funerals to sharing of agricultural implements. Neighbours participate in events of cheer and grief. They take care of sick persons, and in emergency situations, they remain most of the time with the concerned family. According to historical tradition and present practice in Chitral district and other neighbouring valleys (cf. STELLRECHT 1980: 190; BAIG 1997: 136 and STÖBER 2001: 53), in the case of a death in the neighbourhood, all the neighbours are responsible to provide the affected family with meals for three consecutive days. The households currently residing in the neighbourhood divide themselves into groups, and each group is assigned their part of the job. For example, one group is made responsible for breakfast, another for lunch, the third one for dinner, and so on, for the whole three-day period. The individual groups make arrangements among themselves, on mutual consultation, keeping in mind the mealtimes and the number of persons to be fed. Depending on the season, they also contribute a certain amount of firewood to the family of the deceased (cf. BAIG 1997: 136). At the same time, it is also considered important to share the grief with the deceased family, who receive the villagers and relatives who come to offer condolence. The entire male population of the village above the age of 15 is expected to visit the family on this occasion and pray jointly for the deceased's soul. This is generally considered a religious responsibility that should be performed during the three days following the event. Therefore, most of the neighbours and relatives, along with the village priest, remain with the concerned family for the entire three days.

In the case of a marriage, the neighbours and relatives are invited to arrive one or two days before the wedding, and they then take care of all the necessary arrangements for the celebrations. Similar to the practices in Yasin Valley (cf. STÖBER 2001: 53), they set up temporary kitchens, slaughter the animals, and arrange for the seating of the

guests according to the season. Moreover, they organise food, and receive and serve all the guests participating in the marriage ceremony. Traditionally the marriage feasts are open for everyone: anybody can just come and become a marriage-guest and get fed. On this occasion, all the villagers are expected to participate, and nobody except the immediate neighbours and relatives is properly invited. The marriage party is quite long, and is divided into two distinct sections. The actual wedding is performed in the house of the bride. This part of the wedding festivities is relatively short, only up to a maximum of two days. Only close relatives and neighbours are invited, and this part of the event is actually more relevant to women. The women guests traditionally contribute something in kind for the bride (*chighech*). This is expected only from those people who are properly invited (cf. ASEER 1996 and BAIG 1997: 127). After the celebration at the bride's house, the party moves to the groom's family house. The marriage festivity in the house of the bridegroom then lasts about three days. All the relatives are invited, and they also contribute both cash and in kind (*pandar*). The close relatives, however, are requested – and sometimes ordered – to contribute special items, such as a gun, bull, a number of slaughtered sheep/goats, some clothing, etc. (cf. Chap. 4.3.4.1).

Besides social and economic co-operation among the households, there is also an important aspect of mutual forbearance. This is especially necessary in lending and borrowing agricultural implements, draught power, beasts of burden and labour sharing during the peak agricultural season. Sometimes two households in a neighbourhood arrange a co-operative system for performing rotational goat grazing together. The same is also practised for draught power (cf. Chap. 4.6.1).

Unlike the practice in parts of Khumbu region, Nepal (cf. STEVENS 1993: 149), in Odier borrowing a bull for ploughing or other cattle for threshing is almost free of cost, except the provision of straw for the animals. The only exception is the payment of about two kg of barley to the owner of a bull, which has been borrowed to plough the fields in the spring. According to local tradition, this payment is only made in the spring season, and those households who are connected through a *hoyou* system are not compelled to make this payment. Another system of co-operation in pooling the available labour force is practised according to seasonal needs, such as taking out manure from the stables and harvesting crops.<sup>162</sup> Under this arrangement, the whole group works together to do the work for each member of the group in turn, and after the task at hand is completed, the group is automatically dissolved. In such circumstances, the host is responsible to provide food for the whole group.

#### 4.6.3.2 Mosque Management Systems

The mosques located in the upper and lower parts of the village are managed by the households who attend them for daily congregations. These households contribute equally for any new construction or major repair of the mosques. The minimum amount of money and timber to be given is fixed for all households, and extra contributions from anybody in any form are highly encouraged. The purchase of carpets and kerosene for lighting, as well as the removal of snow from the roof and courtyards and

<sup>162</sup> Such co-operative practices have been reported from rural Nepal, as well (cf. SCHROEDER 1985: 39).

daily cleaning are done on a voluntary basis. To make praying and sitting in the mosque comfortable, wheat stalks with the ears removed (*khonu*) are spread below the carpets. The whole neighbourhood provides *khonu* on an equal share basis; i.e. each household provides one or two sheaves. To keep the mosque warm during the winter season, from mid October until the end of April, a certain amount of fuel is needed twice a day, early in the morning for about one hour and again in the evening. Generally, each household has to contribute a fixed amount of firewood. To this end, a variety of arrangements are followed, based on mutual consensus of the participating households.

The most common system for keeping the mosques heated is to collect a fixed amount of wood (roughly 50 kg) from every household in the mosque neighbourhood. All the winter-neighbourhood mosques of the village are currently following this system. During the firewood collection season, each household brings the family's share of wood to the mosque at its convenience. When most of the wood has been transported to the mosque, a day is fixed to formally accept the contributions. On that day, the individual households' contributions are checked, both for quality and quantity, in the presence of many households. If there is any deficiency, the concerned persons are informed.<sup>163</sup>

Another arrangement is for the households to provide enough firewood on a daily rotation basis. When a household has its turn, it is expected to provide enough firewood for about three to four hours in the evening. The number of turns per household during a single season is dependent on the number of households in the mosque neighbourhood. This is considered a compulsory duty of each Muslim household in the neighbourhood, irrespective of whether they attend the mosque or not. The priest of the mosque who leads the daily prayers is exempted from this responsibility. A third system involves the contribution of small pieces of wood by all persons attending the mosque on that day. This is sometimes practised before starting the regular turn system in early autumn, and also in late spring. For the last five years, a new system has been introduced in a few neighbourhood mosques. There they are collecting an equal amount of money from all households attending that particular mosque, and the wood is then purchased in Chitral town and transported up to the village.

#### **4.6.4 Cooperation at Clans' Level**

In many neighbourhoods of Odier, most of the neighbours belong to a single clan; therefore, the above-mentioned co-operative neighbourhood-level activities, with few exceptions, are also part of clan-level co-operation. The bilateral co-operation among

<sup>163</sup> This system of mosque management is very common in most villages having mosques throughout the whole Chitral District. It still persists in Chitral town, as well, which has by now become an urbanised area. In some villages of Astor Valley, Diamir district, Northern Areas of Pakistan, the amount of wood is determined based on the number of male household members above the age of 15, irrespective of their presence in the village (own survey). (For comparison, see also footnote No. 13 of NETTING 1976: 143, as regards the communal management of churches in the Swiss Alpine village of Törbel. The only difference is that in Törbel, the whole community collectively provided fuel for the church from the common forest, whereas in Odier, the individual households, not the whole community, are responsible.)

members of a clan is also not restricted to a single village. The clans additionally function as interest groups in most villages in the Northern Areas of Pakistan, and can be approached for assistance at times of emergency, as has also been reported in Yasin (cf. MOUGHTIN 1984: 321). The following observation by EGGERT (1990: 39) highlights the importance of mutual help and assistance among clan groups in the whole Chitral district:

*„Heute wie früher ist der Klan ferner eine Hilfs- und Notgemeinschaft. Der Chitrali, der auf Reisen Unterkunft und Verpflegung oder sonstwie Hilfe sucht, kann sich immer an die Mitglieder seines Klans wenden, auch wenn er diese persönlich so gut wie überhaupt nicht kennt. Die Angesprochenen sind verpflichtet, dem Hilfeersuchen ihrer Verwandten nachzukommen.“<sup>164</sup>*

The organisation of burial arrangements in the village has until recently always been one of the main clan responsibilities (cf. Chap. 4.6.5.1). As groups, the clans also play a major role in the maintenance of watermills, not only in this village, but also in many other villages of Torkhow tahsil, including Mehlp Valley.

#### 4.6.4.1 Watermill Management, Operation and Maintenance

There are eight main watermills presently functioning in the village.<sup>165</sup> Two clans (Bulay and Somalay) own three watermills each, and the remaining two watermills belong to the Shaipay and Nasketek clans respectively. Moreover, there are mini-groups within the clans that have more than one watermill (Bulay & Somalay).<sup>166</sup> These mini-groups consist of a fixed number of households who have joint ownership of a watermill, and are collectively responsible for its repair and maintenance. In other cases, the whole clan takes the responsibility for their watermill, as an independent group. Necessary replacement parts for the mill are either donated by the relatively rich households in the clan, or are purchased collectively through equal monetary contributions.

<sup>164</sup> At present, due to the improved transportation facilities within Chitral district, the old system of staying with relatives and clans on the way to and from Chitral town has totally ceased. Nowadays, except in the upper part of Yarkun Valley, most of the villages of upper Chitral are within a single day's travel from the centre. However, relatives located in some centralised villages are still providing accommodation for the young students from the remote areas in their houses (cf. Chap. 5.5.2.4).

<sup>165</sup> Contrary to the situation in Yasin (STÖBER 2001: 152), except for three small watermills with very limited grinding capacity, located in the village on irrigation channels, all the main watermills in Odier are in clan ownership. Even the households who own the private mills still all maintain their membership in the main watermills of their respective clans through personal contributions etc.

<sup>166</sup> About 10 years ago, 13 households of the Bulay clan constructed a new watermill after being given land by the Shaipay clan. Before this, these 13 households were without a mill for quite a long time and had used the existing mills on request. The Somalay clan had two watermills in the past, but due to population growth and the relatively short duration of the main grinding season, their mills were under stress. To relieve the pressure on the existing mills, about 15 years ago they constructed another one in a new location in the lower part of the village. One of the watermills of this clan was susceptible to damage by flood and, as a result, remained quite often out of use. In the year 2001, however, all eight main watermills in the village were in proper working order.

Generally, one household head is selected from the clan to be the watermill keeper (*khora wal*) for a period of one year. In addition to doing the milling, the watermill keeper is responsible for some seasonal repairs and maintenance, including cleaning the mill, putting the whole system in order, and arranging for the yak-tail broom and other necessary items for the proper functioning of the system. Up to the late 1970s, the watermills were a good source of income in the village; therefore, this yearly-turn basis was established to maintain equity among the co-owners. The *khora wal* was and still is allowed to charge for his services during the off-season grinding period (*nafkateni*). His fee is about one kg of flour per every 40 kg of grain he grinds, and he collects this from all the households who come to him during this time. During the main grinding season (*peshun*), however, the owners do not pay the watermill keeper (cf. Chap. 4.2.3.1). It is also possible for a non-mill-owner to use the watermill, but only in consultation with and with the permission or recommendation of a member. Likewise, an owner can give his turn to anybody else, including those outside his own group. After finishing his grinding, a non-owner has to give the watermill keeper five kg of flour and a thick loaf of bread, which he has baked in the watermill while his grain was being milled.

Every watermill has two millstones, and these are changed according to need. The upper millstone may be shifted and replaced, either by a new millstone or by the lower one. This depends on the physical condition and other characteristics of the stones. The pair is always selected with considerable care, so that they work together well. Depending on what is needed, new millstones are either made or purchased from others. The whole clan group always makes this decision by mutual consensus. Other necessary mill items are replaced according to the arising needs, either by the *khora wal* or any other member of the clan. Major renovations or repairs, needing more resources and labour, are performed collectively through equal contributions of money and labour.

#### **4.6.5 Cooperation at Village Level**

##### **4.6.5.1 Burial System in the Village and Responsibilities of the Clans**

After a person dies, the burial arrangements are started as soon as possible. If the death occurs during the night, the corpse is kept inside the house and most of the neighbours remain with the deceased's family for the whole night. Early in the morning, the grave is dug and the deceased is given a bath before being shrouded. After all the necessary arrangements are completed, no special bier is used; the corpse is placed on a normal bedstead and transported to an open space outside the house. Then, under the leadership of the head priest of the village, the participants perform the funeral prayer there, and the corpse is then laid to rest in the family graveyard.

Until 2000, a burial in the village was the collective responsibility of all the villagers, with the various duties distributed among the different clans. The households were subdivided into five groups, each with their pre-defined responsibilities. Under that arrangement, the clan of the deceased person was responsible for digging the grave, and the remaining four groups were responsible for bringing one stone slab each, for covering the grave.<sup>167</sup> Supplying these slabs at the time they are needed was a very important obligation of the groups.<sup>168</sup> Moreover, all the households of the village were jointly responsible for providing food for the bereaved family for three consecutive days; they also contributed firewood to the deceased's family (cf. Chap. 4.6.3.1).

The permanent and seasonal settlements in the village are widely dispersed and every family/clan has its own graveyard. Thus it was always difficult to carry stone slabs to the graveyards, especially in the winter, when there was deep snow on the ground. In recent years, with more and more men leaving the village in the winter to earn money in the lowlands and elsewhere (cf. Chap. 5.5.2f.), it became more and more difficult for some of the individual clans to meet this responsibility. Finally there was no alternative but to adapt the old customs to conform to the prevailing conditions in the village. The Nasketek clan, with the least number of households, had the greatest difficulty carrying out their responsibility. To strengthen their capacity and ease the burden of responsibility, the newly emigrated clans, such as Shadayay and Khushay, joined together with the Nasketek clan to form a single group. This group was relatively loose, as it consisted of three clans distributed throughout the village, with very little physical contact with each other. Some of the group members, i.e. the Shadayay clan, were even residing in another village during some parts of the year. Therefore, the group's main difficulty was in informing all the households of the group in time to make the necessary arrangements to meet their responsibility.<sup>169</sup> Most of the villagers were dissatisfied with this group's contribution. Some hot words were exchanged with this group on a few occasions, and in one case, there was a real brawl with them. Under this system of clan organisation of burials, there were many grievances and much stress at the inter-

<sup>167</sup> The graves are normally deep pits, more than one-meter in depth, with stone walls on all four sides. After the body has been laid in the pit, the grave is covered over with four stone slabs, which are placed on top of the walls. Other households of the village generally shared responsibility, and helped the clan of the deceased person dig the grave, furnishing extra work wherever it was needed.

<sup>168</sup> For the burial responsibilities, the Somalay clan was divided into two groups, while the other three clans each comprised a single group. In the past, this allocation of responsibility for the groups was attached to a corresponding benefit. The groups responsible for providing grave-slabs were entitled to receive a certain amount of traditional food, served by the deceased's family on the third day following the event. In the old days, when hunger was rampant, a group with fewer members had a distinct advantage in sharing the fixed amount of food among them. Nowadays, there is no hunger in this village as such, and due to the seasonal migration of able-bodied man from the village, it has become very difficult for such groups to manage their burial duties, especially during the winter season.

<sup>169</sup> According to the local traditions in the whole district, the deceased person must be buried as soon as possible. Normally the whole process takes about three to four hours. Hence, the respective groups have to react very rapidly after being informed, to arrange a slab or otherwise carry out their respective tasks. To find a proper grave slab, finish it properly and carry it to the burial place needs considerable time.

group level; nevertheless, the system continued to function quite smoothly according to the traditional principles until the controversy over the construction of the micro-hydroelectricity plant arose. At that point, all the households of this village split into two groups. Consequently the old clan-based burial arrangements had to be abandoned (cf. Chap. 5.8).

#### 4.6.5.2 Bringing a new Watermill-Stone from the Pasture

Rocks suitable for making millstones can usually be found only far away from the village. Although some millstones have been found in the village, most of them, were brought back, already constructed and properly finished, from a distant place called Phur zerch, about 15 km to the southwest of the village. To accomplish this, the majority of the male clan members first visit Phur zerch for about one week, to find an appropriate stone and make it into a millstone. To organise the labour force required to bring the millstone back to the village, some of them then come back to recruit others from the entire village community (*oolat*) to help bring the millstone home. The clan in need of help can either send messages to the various neighbourhood mosques, or request that a formal announcement be made in the central mosque of the village after the Friday congregation. Traditionally, helping with the millstone is considered a communal responsibility, and the individual clans, as mill owners, are accountable for requesting and arranging the *oolat* assistance. In normal circumstances, every clan is expected to send a reasonable number of adult men. In the past, it was compulsory for each and every household with an able-bodied male at home to participate in bringing the millstone. Nowadays, however, all the clans with watermill ownership have sufficient labour force within the clan itself, and only additional help is needed. In general, about 60 to 70 strong men are needed for this adventurous work of rolling the millstone home.

Transporting the finished stone takes three to four days, and the host clan makes proper arrangements for providing food and drink to the helpers. For this purpose, an ox or two to three sheep are slaughtered, in addition to the other traditional food. The whole village shares the implements necessary for moving millstones, because they are only needed once or twice a decade. Previously this fetching of a new millstone always took place in the autumn after the crops were harvested, as the paths and other passages between the fields were too narrow to use without damaging the crops during the growing season. However, at present, the whole procedure has become relatively easier, since jeepable roads have been extended to all neighbourhoods of the village. Therefore today, in some cases the water-millstones can also be partially transported by jeeps. Nevertheless, some human labour is always needed, because all except one of the watermills are still inaccessible to motorised traffic.

#### 4.6.5.3 House Construction as a Cooperative Work

Construction of a new house has always been a communal work in the village. Since the heavy cost and labour needs are usually beyond the capacity of a single household, this task is carried out by mutual exchange of labour, under the *yardoyee* system. In this case, the reciprocity arrangements range from the neighbourhood to the village level, with the close relatives also contributing other items, in addition to labour. As in other



mountainous areas (cf. BISHOP 1990: 170 and GUPTA & URA 1992: 563), it is a general perception in the village that house construction is the work of *oolat*, the whole community; and anybody building a house, being a son of an *oolat*, expects help from the villagers. The nature of assistance varies according to the work in progress, so the host family requests the appropriate persons to help with the various tasks. For example, masons are needed to erect the walls, as well as common helpers. To help the carpenter prepare the woodwork, semi-technical persons with some know-how in the relevant field are approached. Even young people who have free time share some of the work. In general, a greater burden is placed on near relatives. The common people, upon request, share one or two whole days' work during the peak labour demand, i.e. erecting the walls and covering the roof. During the entire time, the house owner provides the helpers with better-quality food, mostly with meat. Sometimes the villagers also contribute timber for the house construction to those in need, along with other assistance.

#### 4.7 Village Artisans, their Services and Traditional Payment System

The village craftsmen used to play a very important role in the socio-economic and cultural spheres of the villages throughout the whole northern mountainous belt of Pakistan. In the remote villages of Chitral, according to the local tradition, people do most of their work on their own, but for a few specialised activities, craftsmen are employed (ISRAR-UD-DIN 1965 and HASERODT 1989a).<sup>170</sup> In the past, most of these artisans were brought in from other areas upon request of the former rulers, as well as the villagers (cf. SCHOMBERG 1938: 165, 205 and ISRAR-UD-DIN 1965: 100). The rulers gave them arable land and access to other natural resources in exchange for their services. Each craftsman then performed his specific duties and was paid additionally by the villagers. In general the payment system varied from artisan to artisan. The following system of payment is part of the culture and can be substantiated from the historical sources:

*„Each craftsman has, as among the Pathans and Kohistanis of the Indus area, a defined clientele, for which he performs the traditionally required services and receives a traditional yearly payment. The carpenter receives 16 seers grain (one seer is roughly equivalent to 1 kg.)/house/year; the blacksmith receives 16 seers/working plow (bullock pair)/year ... The barber is given 20-24 seers of grain/house/year; ... Finally weavers have no standard arrangement for clientele or payment; they sell to, or barter with, either local farmers or traders in Bahrein or other market towns.“ (BARTH 1956a: 71).<sup>171</sup>*

As in the whole Chitral district, in Mehlp Valley there was never a tradition of barbers, and each settlement unit has its own weavers and carpenters. Some necessary speciality

<sup>170</sup> According to BIDDULPH (1880: 65), “They [the artisans] are called *Ustâds*, “artificers,” and are divided into *Dertoché*, “carpenters,” *Dergéré*, “wooden bowl makers,” *Koolalé* “potters,” *Dom*, “musicians,” and *Mochi*, “blacksmiths” ... No *Ustâds* are found in Kashkar Bala [Upper Chitral] or Ludkho.”

<sup>171</sup> For comparison with other traditional societies in the Middle East and Himalaya, see also ENGLISH (1973: 152) and BISHOP (1990: 193f.).

items such as pottery were purchased from the Madak villagers of Mulkhow tahsil. They usually visited Odier in the autumn season to sell their utensils in exchange for grain. Wooden bowls and large-sized sieves were purchased from the Khot villagers. The local craftsmen in Mehlp Valley were the blacksmiths, residing in Shoat Village. They were responsible for making and repairing agricultural implements for the whole Torkhow tahsil, excluding the Rech Valley. To streamline the system, the artisan families were divided among the villages, and each family was responsible to serve its respective groups in the concerned villages. In return, as in other parts of northern Pakistan, the concerned households were obliged to pay the blacksmiths for their services (cf. BARTH 1956a: 26). This system is still maintained today, according to the tradition, although many of the artisans do not give any particular preference to their old profession anymore, and have shifted their attention to other activities and more lucrative jobs. As a result, along with performing their traditional responsibilities, many of the younger blacksmiths are also working for others for additional cash. There are a few musician families residing in Shagram Village. They are collectively responsible for serving the residents of the whole Torkhow tahsil (cf. Chap. 4.7.2).

#### 4.7.1 Village Blacksmiths and Responsibilities of their Clients

There are nine households in the neighbouring village who serve the whole valley community as blacksmiths. Each village has its own smiths. The blacksmith is responsible for making, repairing and maintaining necessary agricultural implements for the whole village community. As is done in other villages in upper Chitral (cf. HASERODT 1989a: 152), the blacksmiths visit their respective villages for a few days, upon prior request, to repair the agricultural implements. They also sell agricultural implements to the villagers on payment, mostly in kind, consisting of either fodder or firewood. In Mehlp Valley, the smiths are respected. Their profession is not looked down upon, as in other parts of the northern mountainous belt of Pakistan (cf. BARTH 1956a). On the contrary, the blacksmiths belong to the most respected clan of the district (Zondray). They are respected and treated as equal households in all matters concerning the villages and valley.<sup>172</sup>

Because his services are so vitally important, the villagers as a whole are responsible for the maintenance of their respective smiths' household. Each individual household contributes two *bati* (about five kg) of barley every year, which the smiths collect from their respective villages in the autumn. The villagers also provide the smith with some firewood and fodder (the amount is not fixed). They are also responsible for providing him with charcoal and helpers to assist him with his work for their village.

The smiths are additionally entitled to receive prescribed gifts on the occasion of marriages and circumcisions. The blacksmith's share on these two occasions consists of a fixed quantity of food, which always include a foreleg of sheep or goat. The blacksmith visits the concerned household on these occasions and collects his share. In case the prescribed items are unavailable, he is compensated in either cash or kind. In any case,

<sup>172</sup> Although this trend of social hierarchy at the village level is not so strict in Chitral district as it was previously, it is still maintained in some villages of the Northern Areas of Pakistan in regard to blacksmiths and other village artisans.

all possible means are employed to avoid annoying him. He must be kept satisfied at all times and all costs, and is usually given additional gifts in kind, such as fodder and firewood.

Even nowadays, there is no alternative to the smiths – not only in the village, but also in the whole tahsil. For this reason, all the traditional shares are properly paid to the blacksmiths. Any falling out with the smith causes a lot of problems for a household. He can refuse to repair the necessary agricultural implements at the most critical time of the year – and since all smiths recognise the implements of their respective clientele, there is no way for the household in disfavour to trick him by enlisting the help of his neighbours or family.

The blacksmiths of the respective villages (Odier, Shoat and Mehlp) have their individual workplaces (*dukan*), which are located close to their houses in the Shoat Village. These *dukan* are small square-shaped rooms each containing a forge located below an opening in the roof. There is an anvil (*samzan*) fixed on a big block of wood, with an adjacent trough full of water. The bellows are made out a pair of sheep- or goatskins, properly fixed to blast the fire; they are worked (alternately inflated and emptied) by a helper. The smith needs some additional help for his work and usually has at least two helpers. He uses various instruments, including tongs (*chapi*) for pulling the iron out of the forge and a number of hammers (*chota*) for shaping the hot metal into the desired shape, fashioning it by repeatedly beating it on the anvil.<sup>173</sup>

#### 4.7.2 Duties of the Musicians (*dom*)

There are only a few families of musicians left in the area, and they reside in the tahsil headquarters, Shagram. Of these, one *dom* family alone is responsible for circumcising the male children of the whole tahsil – a traditional *dom* role. Unlike Yasin, where the old ways have been replaced by modern techniques (cf. STÖBER 2001: 54), most households in Torkhow tahsil still prefer the traditional method of circumcision. The apothecaries also offer this service, but that is usually not preferred by the villagers. This may be because the local chemists' methods and techniques are no better than the traditional ones, and since most of them do not have enough experience, occasional complications and after-effects of the procedure have occurred. In comparison, the age-old traditional system is very effective and dependable. No such complications or after-effects have occurred in living memory, and thus the local people still trust the old ways. The circumcision of the young boys is usually carried out at the age of three or four.<sup>174</sup> Today the *dom* who performs the circumcisions is responsible for arranging things on his own. He makes yearly tours through the whole tahsil in the autumn season, and informs the respective villagers in advance of when he is coming. In the year 2001, his fee was Rs. 300 per circumcision.

<sup>173</sup> Both the smith's style of working and the instruments he uses are quite similar to those used in Kamdesh, Kafirstan, more than a century ago, as described by ROBERTSON (1896: 544f.).

<sup>174</sup> According to the religious teachings, one of the obligations of parents is to circumcise their male children. All households strictly follow this practice, and all boys are normally circumcised by the age of five.

Normally he takes one to two days for the whole of Mehlp Valley, and the households in need of his service either wait for him or accompany him on his rounds until their own turn.<sup>175</sup>

Aside from this, the rich families also invite members of the *dom* family to play music during the wedding festivities. Other artisans, such as weavers, carpet makers, carpenters etc., have no specified clientele. In case of need they can be brought in on request or are approached for the performance of the required services. They are usually paid for their work in both cash and kind.

#### 4.8 Summary

In uncertain environmental conditions such as Odier's, where the traditional livelihood strategies usually consist of a variety of interrelated and interdependent activities, co-operation is maintained through different community-based institutions, as well as at the single household level. This is quite clear from the gender division of labour, reciprocal labour exchange, communal labour mobilisation and collective decision-making in matters relating to the village resources and main infrastructures, such as repair of jeepable roads and watermills, irrigation channel maintenance etc. The whole system is oriented to ensuring the collective sustenance of the whole village community by sharing the limited natural and material resources. This is clearly manifest in the collective seasonal movement for the utilisation of far-away and seasonally productive resources (i.e. pastures), the sharing of agricultural implements and draught power, and grazing organisations for different livestock species. Through seasonal movement, the individual households are also able to conserve some of the highly valued and scarce resources – fodder and firewood – at the relatively lower-altitude houses for winter-season consumption. All activities beyond the capacity and capability of a single household are accomplished through very effective networks of relationships and compulsory reciprocities. The only investment needed to maintain the system and keep it functioning is physical participation and co-operation in reciprocity and exchange patterns with neighbours, relatives and other villagers. At higher levels of co-operation, the contribution of member households is efficiently regulated through social pressure and apparently strict punishment. The social control mechanisms are very effective, and the dependability of available resources is still relatively high.

Until very recently there was also a high degree of dependency on locally manufactured products. The whole system of exchange was through barter, and in the village, livestock were the main resource for purchase and payment of required items. Most activities related to agriculture and animal husbandry were and are still today, to a great extent,

<sup>175</sup> After the death of his father, the young man now responsible modified some of the old traditions, especially the payment system for the circumcisions. In the past, the arrangements were more formal and the procedure was very expensive. As a normal fee for a single circumcision, his father charged one silver ring, one aluminium bowl, about a kilogram of fine-quality lamb-wool, a sheep or goat, and many other minor items. After his yearly visit to the village, the respective villagers would drive all the sheep and goats to his house. Also, according to the local traditions, he had to be properly requested, and a person from the village would be sent to accompany him on the way to the village. He would spend at least one or two nights in each village, and special arrangements were always made for his stay.

carried out through co-operation and mutual co-ordination between neighbours and relatives. Up until 1980, there was no shortage of labour force for animal husbandry in the village, and most of the daily-grazing organisations were intact. Nevertheless, off-farm sources of income had already been introduced in the village on a very limited scale, and a two- to three-month-long spring-season hunger period was a common feature in the village life cycle. Change in the overall socio-economic set-up was quite slow and mostly traditional crops were grown, such as foxtail millet and different varieties of local frost-resistant wheat.

## 5 Recent Changes and their Impacts on the Village

### 5.1 Overview of the Driving Forces

For the last two decades, change has been the main topic of research on the mountainous regions of Hindu Kush, Himalaya and Karakorum. Researchers have attributed these changes to several main driving forces: change in the political set-up, unprecedented population growth, and transformation of the economy due to improved accessibility. The increased accessibility, in particular, is considered to be a major driving force for changing the whole socio-economic set up and land utilisation in the area (ALLAN 1984b, 1985a, 1986b, 1989, 1991; KREUTZMANN 1991, 1993b, 1995a; STELLRECHT 1997, 1998b and STELLRECHT & WINIGER 1997). All-weather roads have opened up the so-called 'closed' and relatively remote mountain societies to the outside world and exposed them to the contemporary scenario. As a consequence, the pace of changes in the northern mountainous belt of Pakistan, as in other parts of the world, has been rapid and relatively unprecedented in the history of the region. The local inhabitants are unable to respond properly to these changes, at the rate with which they are occurring. This is becoming a major challenge, not only for the local-level resource management systems but also for the sustainable development of mountain areas (IVES, MESSERLI & RHOADES 1997: 456). Still other factors are negatively contributing to sustainable mountain development and increasing the mountain communities' vulnerability. These include globalisation (cf. JODHA 2000a & b), serious conflict situations in the mountain regions (LIBISZEWSKI & BÄCHLER 1997), socio-economic transformation and unequal access to natural resources (BANDYOPADHYAY 1992) and climate change (PRICE & BARRY 1997). However, in case of the Himalaya [in the broader context] two additional factors such as multiplicity of ethnolinguistic groups and rapid socio-economic transformations has been considered as problems for sustainability conditions in the region (cf. STONE 1992: 115). In addition to the above-mentioned constraints, the mountain inhabitants also need to find appropriate measures to mitigate natural and human-induced hazards, in order to avoid their adverse effects (HEWITT 1992, 1997).

With the passage of time, changes and transformations are having an impact on the entire structure of traditional societies throughout the mountainous region of northern Pakistan. The hierarchical structure of the feudal societies has changed entirely, and the impact of this is felt even in the remote and peripheral villages of the area. The transformations of the traditional socio-political set-up in the region started in the 19<sup>th</sup> century, after the incorporation of the region into the sphere of the British Indian Empire. Nevertheless, in the peripheral areas the effects of the political changes were relatively slight until the creation of Pakistan in 1947. Even then, the stronghold of the hereditary rulers and local elite remained intact in most of the mountainous areas until the late Z. A. Bhutto abolished feudal rule in 1974. In Chitral the traditional political system changed a little earlier than in other small principalities in the Northern Areas. This occurred in 1969 with its integration into the North West Frontier Province (NWFP), when Chitral, along with the former states of Dir and Swat, became a regular district of the Malakand division (cf. Chap. 2.2.5).

However, in the early 1980s the Russian invasion of Afghanistan, and later on Afghan's ensuing civil war, also induced a lot of socio-economic, cultural and ecological changes in the whole North West Frontier Province. During that period more than 3.5 million Afghan refugees migrated to Pakistan (ALLAN 1984a, 1987a; HASERODT 1989: 107 and HOLDSCHLAG 2000: 133). They were accommodated mostly in the districts of Baluchistan and North West Frontier Province, which border on Afghanistan along the Durand Line. Refugee camps were established in the forest-rich districts of the province. According to ALLAN (1987a: 202), the direct and indirect impacts of Afghan refugees on the vegetation resources of NWFP were enormous. The lower part of Chitral district, in particular, was one of the most severely affected areas, and extensive deforestation took place, mostly in the state-owned forests and high alpine pastures. Many Afghan refugees also opened local businesses. Still today most of the restaurants and traditional bakeries (*tanur*) in both the Chitral and Drosh bazaars belong to them (cf. HASERODT 1989:146).<sup>176</sup> In their restaurants they introduced an entirely different pattern of dining, which was adopted by the local people in the bazaars. In the Chitral bazaar, the Afghan refugees also ensured all-day availability of food and bread for travelers and local population. According to the district administration, more than 20,000 Afghan refugees are still living in Chitral district.

Mehlp Valley also witnessed drastic socio-economic changes after Chitral State was integrated into the Pakistani administration. Changes are evident in every sphere of life, from land tenure and cropping patterns to political organisation, dress, food habits, house design and layout, and domestic gadgets. The majority of these transformations occurred in a relatively short period of time, mostly within living memory of the local inhabitants (cf. STALEY 1969: 239f.). Similar to other parts of the Northern Areas of Pakistan and Chitral, the main driving forces behind these rapid transformations were changes in the political system, rapid population growth, intra-regional accessibility and the provision of basic facilities and public amenities. In the latter case, the establishment of schools even in the remote areas not only changed the whole traditional social structure, but also provided opportunities for some of the academically qualified persons to earn cash income in the mountain villages.

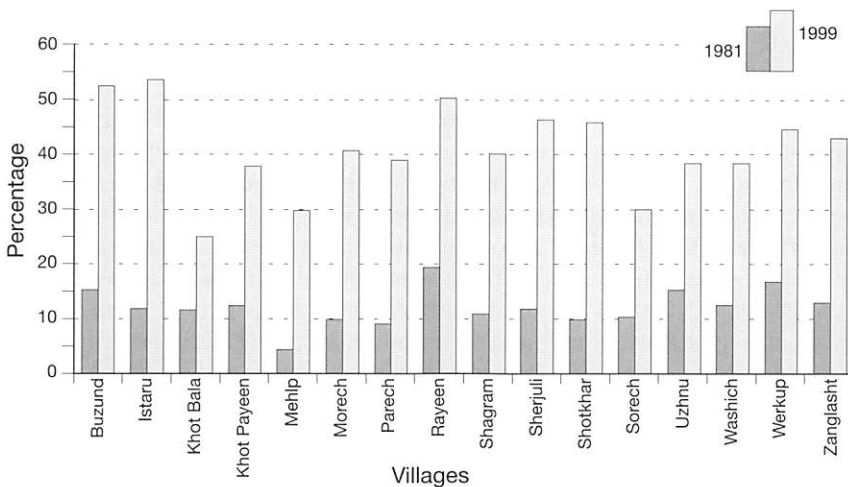
As a result of post-independence reforms in the principality, the first primary school for boys was established in Mehlp Valley in the early 1950s by the former state authorities. Following the major administrative reforms by the government of Pakistan in the early 1970s, two more primary schools for boys were opened in the valley. This access to basic education and new ideas brought many changes in the traditional society. This can be easily assessed by taking the literacy rate as an indicator of change and development. In less than two decades' time, from 1981 to 1998, the literacy of the population increased manifold, not only in Mehlp Valley but also throughout the villages of Torkhow tahsil

<sup>176</sup> To ensure the meat supply for their customers in the restaurants, some of the Afghan refugees also took over the meat provision in the town area. Initially they travelled throughout the whole district for purchasing livestock. This provided the local farmers with a better opportunity to sell their animals. The refugees also offered relatively better prices and even went up to the high pastures to purchase yaks. This was one of the main reasons for the rapid decrease of the yak population in Odier village. Later on, the refugees reorganised this business and started bringing the livestock in from the neighbouring localities of Afghanistan.

(GoP 1983 & 1999) (Fig. 5.1).<sup>177</sup> Moreover, the increasing number of children enrolled in schools and other informal educational institutions has also changed the traditional division of labour in animal husbandry and other domestic spheres.

Another factor of change is the simultaneous rapid increase in population and disintegration of the joint-family system. This has diverse impacts on many aspects of mountain life and livelihoods (cf. HALVORSAN 2002). On the one hand, population growth and establishment of new households has resulted in a general decrease in land-holding size and led to fragmentation of the cultivated land. On the other hand, the potential labour force available for performing different farming activities at the household level has also decreased. The increasing number of individual households has intensified the utilisation/sharing of common property resources. Moreover, increase in livestock population as well as the separate heating and cooking arrangements of the numerous households has further increased the pressure on available resources of both fodder and firewood. Similar to other mountainous regions, in this village the decrease in male labour force at the household level, as well as in how much cultivated land the households own, has had effects. Both are very closely related with animal-husbandry practices in general, and in particular with the number of different animal species per household (cf. Fig. 4.2a, b & Tab. 4.1).

At the same time, increasing accessibility of the remote areas has also facilitated large-scale seasonal out-migration from the villages of the valley. In the late 1960s and early 70s, the construction industry attracted many non-skilled labours from the hilly and mountainous regions, and a considerable economic integration of this valley with the plain areas took place. On the interregional scale, however, Chitral district still suffers



Source GoP 1983 and 1999

**Fig. 5.1 Village-wise Change in Literacy Rate in Torkhow Tahsil 1981-1998 (Persons 10 years and above)**

<sup>177</sup> Literacy figures for the individual villages of Torkhow tahsil are not available from the earlier censuses of 1961 and 1972 (GoP 1961 and 1976).



heavily from accessibility problems due to the seasonal closure of Lawari pass (3118 m) for traffic. Thus it remains cut off from the rest of the country for about five months of the year, from December till the end of April.<sup>178</sup> Later on, the possibility of getting jobs in the oil-rich Gulf States with the help of private overseas-employment promoters increased the chances of earning hard currency for the country, and helped to develop a remittance-based economy in the village. In the country's deteriorating economic situation, with limited possibilities, or complete unavailability, of work for the daily-wage labourers at home, the international migration worked as a safety valve for keeping the subsistence livelihood intact. Individuals who left the villages to work elsewhere were able to provide their families at home with money to purchase basic food items and other necessities. This is generally the case in many remote and marginal villages of the district, and in Odier, in particular, at present a substantial amount of the cash income is derived from international remittances (cf. Chap. 5.5.2.3).

## 5.2 Changes in Agriculture

Similar to the traditional, integrated system of survival in the whole northern mountainous region of Pakistan, the basis of the centuries'-old subsistence economy in all the villages of Mehlp Valley was the cultivation of different crops and keeping of various livestock species (cf. Chap. 4). At present, agriculture in Mehlp Valley has been partially mechanised. High-yielding seed varieties have been introduced in the valley, and substantial quantities of chemical fertiliser are also applied to increase agricultural production. However, up till now these innovations have not totally replaced the centuries'-old system of integrated and co-ordinated survival mechanisms, known as mixed mountain agriculture. The local inhabitants are facing both cost-benefit constraints as well as technical difficulties in their adjustment to the changes and transformations. These difficulties are due mainly to the socio-economic and physical limitations that prevail in Mehlp Valley and elsewhere (cf. PILARDEAUX 1997, 1998).

In the remote and peripheral localities of Chitral district, intra- and inter-regional accessibility problems are yet to be resolved (cf. HASERODT 1989: 119). However, the changes and transformations in crop rotation and cropping pattern in Swat valley and Hazara division as postulated by ALLAN (1984a, 1987b and GRÖTZBACH 1989) have not yet reached the peripheral valleys and remote villages of the Eastern Hindu Kush. Moreover, due to the persistent importance of both agriculture and animal husbandry for subsistence survival in the Northern Areas of Pakistan and Chitral district (cf. HASERODT 1989; NÜSSER 1999 and EHLERS & KREUTZMANN 2000b), the inhabitants of the whole region have been forced to introduce innovative readjustment strategies. These strategies are designed to simultaneously accommodate the changes and transformations at village and household levels, while still enabling the villagers to carry out both agriculture and animal husbandry. Many modern innovations have been grafted onto the traditional agricultural system, such as new seed varieties and chemical fertilisers. At the same time, animal husbandry practices are modified depending on the local situation: either hired shepherds are engaged, or the general herd composition has been

<sup>178</sup> This accessibility problem during the winter season has been resolved on an ad-hoc basis. Since 1989-90 the Kunar Valley road through Afghan territory is used as a main connection between Chitral and rest of the country from December till mid April.

modified to resolve the problem of seasonal labour shortage and fodder deficiency (cf. HUSAIN 1992: 700; NÜSSER 1999 and EHLERS & KREUTZMANN 2000b: 18) (cf. Chap. 5.3).

The fact that food grains and other products are now available at the local market for cash payment has been a major factor in changing the inhabitants' staple diet. Consequently, the old crop rotation and cropping patterns have also been modified to a great extent. This has resulted in a general decrease in crop diversity at both local and regional levels. The ready availability of subsidised grain, along with the introduction of new crops such as potato, has to some extent solved the nutrition and food-shortage problems. Spring season famine/malnutrition is almost a thing of the past (cf. ALLAN 1989: 139). Moreover, the old practices of storing flour and grain for emergencies such as childbirth and burial ceremonies are no longer practised. Marriages, once restricted to the season of food availability (cf. BIDDULPH 1880: 78), can now be celebrated at any time of the year, without any constraint.<sup>179</sup>

In the agricultural sector the most important change was the security of land tenure conferred on the local peasants by the Pakistani government after the abolition of the feudal rule. In most of the cases the small peasants became de facto owners of their holdings and no longer had to pay any further land revenue to the feudal rulers. Moreover, the system of forced labour and other associated state services were also abolished as part of the new reforms (cf. Chap. 2.2.5). Land ownership became stable and households were for the first time assured of reaping the fruits of their investment in the arable land. This has had a profound effect on agriculture and has thoroughly changed the patterns of land utilisation in this valley under study.

In the context of land tenure, the most important assurance granted by the state authorities was the protection of ownership rights of arable land. Old cases of land alienation were not to be re-opened anymore. This meant that those people who had received arable land from the feudal rulers in any capacity were not to be brought into the court of law. Nevertheless the land reforms carried out at national levels in the late 1970s created a lot of problems throughout the whole district. The implementation of the reforms caused long and unending litigations between the former landlords/royal family and their tenants, which are still going on throughout the whole district (ISRAR-UD-DIN 1995a: 165f).

<sup>179</sup> In the case of a death in a family, in the past it was the family's compulsory duty to provide a fixed amount of food to each clan in the village. The burial responsibilities were distributed among the clans, and this sharing of the labour was then acknowledged and rewarded with this meal; its provision was one of the household's most important obligations. Therefore, a certain amount of flour, grain and butter were always stored specifically for this occasion. Moreover, a sheep or goat was also specially fed to ensure that meat would be available for this meal. All the households of the village provided firewood for cooking this food (cf. Chap. 4.6.5). With increasing food security in the village, this old tradition of distributing food to the different clans has been totally abandoned, although the family still serves a meal and firewood is still provided to the deceased's household, as a legacy of the past. In the case of marriages, the traditional practice of exchanging of barley for locally grown rice from the lower-altitude villages has been discontinued, because nowadays rice can be bought in the local market for cash. Marriages are no longer seasonally bound, and instead of barter goods, nowadays money is needed to purchase the necessary items.

With the stability in land tenure and relief from different types of taxes (cf. Chap. 2.2.5), not only was the available arable land more intensively used, but new areas were also brought under plough. This affected mainly the areas near the village that had been usually used for grazing sheep and goats (*pai rochini*) (cf. ISRAR-UD-DIN 1965). These areas had been previously kept under clan ownership and used for seasonal grazing to avoid payment of land tax and associated state duties. Now that the villagers owned the land and were entitled to keep the produce, they reclaimed these areas on a priority basis. At the same time, the area under irrigated plantations increased manifold.<sup>180</sup> This can also be attributed to the security of land tenure. For example in the extremely cold conditions prevailing in Odier (cf. Chap. 2.1.2), a poplar tree normally takes more than a decade to attain a length and girth that makes it suitable timber for construction purposes. Therefore, without favourable ownership conditions, long-term investment in the arable land was not feasible. Meanwhile, with the rapid increase in population and degradation of the nearby forest resources, the domestic demand for fuel and timber in this village also increased considerably. This became another motive for extending and increasing the area under irrigated tree plantations.

### 5.2.1 Changes in the Arable Land Ownership

The persistent increase in population (cf. Chap. 2.3) and establishment of nuclear families in the village has resulted in the fragmentation of arable land. With every successive division of a farm among its inheritors, the share of the individual households decreased, becoming smaller and smaller (cf. Fig. 3.7). There were some mitigating factors. The former state authorities partially encouraged the process of land reclamation by constructing new irrigation channels. Likewise during this time, the households were able to purchase land from the absentee landlords and their emigrated relatives. These two – the new land reclamation and the purchases – greatly helped to maintain the arable-land ownership of the households. Nevertheless, the number of households with less than one acre of cultivated land (excluding the leased land) increased from 20 (28.98%) in the 1970s to 34 (28.33%) in 2001. Whereas, the number of households with more than four acres of cultivated land decreased from 28.98 percent in the 1970s to 9.1 percent in 2001. Similarly, the number of households with less than average holding size also increased from 45 (65.2%) in the 1970s to 77 (63.1%) in 2001.<sup>181</sup>

Many households benefited from the purchase of land, especially those who had financial means to buy such land. The land in the village was and still is very expensive, with a high degree of price variation, corresponding to location. In 2001 the price of one *chak* (ca. 30 square meters) of arable land in the lower part of the village was about Rs. 80,000. In the upper part, a *chak* cost Rs. 70,000; and in the summer settlements it

<sup>180</sup> The extensions of irrigated tree plantation are quite obvious if one analyses the various photographic studies made over the years and the vegetation map of Chitral (cf. NÜSSER 2001 and NÜSSER & DICKORÉ 2002: 53). However, in the western Himalayas around Nanga Parbat, this expansion of tree plantations did not occur. For further details, see NÜSSER (2000a & b).

<sup>181</sup> The single household with more than ten acres of cultivated land actually owns only half of the total acreage. The current head of the household became only a temporary owner after the death of his brother. Moreover, the father of this household was a *Charbu* (lowest administrative official) during the former state time.

was less than Rs. 7,000 – almost 10 times lower than the price in the upper part of the village. This clearly shows the scarcity of arable land in the village. Such land is quite expensive compared to its productivity, which is quite low, yielding a single crop in two years. Most of the arable land in the village (about 70 percent of the total) has been either purchased from absentee landlords, or it was granted by the state authorities in the past and then inherited by the descendants from their ancestors. In Yasin valley, land transactions were infrequent among the households (STÖBER & HERBERS 2000: 53). Odier, however, presents a different picture. Since the 1970s, for instance, 44 percent of the present household heads have purchased 42.820 acres of cultivated land. The absentee landlords still own 7.7 percent of the total cultivated land of this village (cf. Chap. 3.2.3). At present, since many individuals are earning money in the Middle East (cf. 5.5.2.3), there is no problem with finances in the village; nevertheless there is a very limited amount of land available for sale on the market. Many absentee landlords have benefited from this situation by creating competition among the potential customers. This was most probably the main cause of the drastic increase in the price of arable land in Odier.

Trying to reconstruct the land occupancy/ownership in this village for the purposes of drawing comparisons and projecting an anticipated future scenario of land ownership is quite difficult. The tenants changed successively, from time to time, and many households also purchased arable land as well as extending their own cultivated area. Since arable land is jointly owned by household members, and only the sons have the inheritance right, it might seem easy to calculate a prognostic land-ownership scenario. However, the composition of a household is complex, including parents, children, and grandchildren. In some cases up to three brothers are living together as a single household (cf. Fig. 2.5). In addition, the potential inheritors do not always have the same share in the cultivated land owned by a household head; their share depends on their status in the family. Also the land division among the real inheritors (brothers) itself is only rough, without proper measurements (cf. Chap. 3.2.4). Therefore, trying to project into the future is not a simple job of arithmetic.

Nevertheless, according to the data collected from the village in 2001, there were six households without any real inheritors (sons), although in general the number of potential inheritors is constantly increasing in tandem with population growth. In addition, some arable land is still owned by absentee landlords (cf. Chap. 3.2.3), and the current tenants are not the only ones eligible to purchase it, in case of future sales. However, due to the increase in population and number of households in the village, the average land-holding size of a household (including the cultivated land currently held under the tenancy system) decreased from 3.84 acres in the 1970s to 2.17 acres in 2001.

Based on these figures, then, it can be estimated that in about two to three decades, when all the potential inheritors now living have established their own households in this village, the average cultivated land ownership would further decrease to 0.59 acres per household.<sup>182</sup> This paints an alarming picture, as there is very little possibility of extending the cultivated land any farther, and more intensive utilisation is also not possible, given the peculiar physical constraints in this high-altitude village.

### 5.2.2 Changes in Crop Rotation and Cropping Pattern

A household usually considers three main issues in selecting crops, namely food and fodder self-sufficiency and soil fertility. Moreover, due to fragmentation and distribution of cultivated land at different altitudinal levels, crop suitability is an additional factor to be considered (cf. Chap. 3.2.1). Individual households organise their farming activities depending on their food and fodder requirements, and follow a yearly crop-rotation system.<sup>183</sup> With the passage of time three interrelated factors, i.e., decreasing landholding size, introduction of new crops (potato and maize) and availability of foodstuff in the local market, have thoroughly changed the old cropping patterns. Meanwhile, minor changes in the weather and climatic conditions have also favoured these transformations.<sup>184</sup>

In the past, hashish (*chars*) was the most profitable cash crop of the high-altitude villages, including Mehlp Valley (cf. Chap. 4.4). Later on, however, its cultivation was prohibited, which obviously had adverse repercussions on the economy of the households of high-altitude and relatively remote villages.<sup>185</sup> The affected households were not properly compensated for this loss, although the government received substantial aid from the international community for their anti-narcotics programmes.

With the passage of time some of the traditional crops, such as foxtail millet and different varieties of peas and wheat, totally disappeared from the fields of the village. Along with some minor food crops, barley was the villagers' staple diet. Today, except for a few households, wheat has become the staple diet, and other cereal crops (including barley) are grown either to be sold in the market or directly exchanged for wheat.

<sup>182</sup> In 2001 there were 547 males in the 120 households of this village (cf. App. 1.3). One male per household is assumed to be the household head (father), and the remaining are regarded as potential inheritors. Following this assumption, there would be 447 households in about three decades time, if all of the inheritors remain alive and do not emigrate away from the village.

<sup>183</sup> Contrary to the findings of ALLAN (1985b) in the central Hindu Kush, the factors influencing crop selection and the resultant cropping patterns in this village are closely related to land ownership and location of the fields.

<sup>184</sup> Because of weather and climatic constraints maize was not grown in the upper part of the village until the 1970s, and crop failure was common in the summer settlements. Therefore, foxtail millet and two short-ripening varieties of wheat (*doghulu* and *bashgalan*) were widely cultivated in Mehlp Valley as well as other high-altitude villages of the district (cf. HASERODT 1989a: 128).

<sup>185</sup> Today *chars* is still grown illegally in the remote villages by a limited number of households, but in the past there was state protection and encouragement for its cultivation.

Potatoes have also become popular in this village, and almost every household is sowing this crop mainly for its own domestic needs. The potato crop has substantially improved domestic food availability, and also provides some cash income to many households of this village.<sup>186</sup>

Presently, most of the village households are unable to carry out the traditional crop rotation system, and many are even practising, to some extent, mono-cropping. For example, in the lower part of the village, potato and maize have already replaced the seasonal fallow; therefore, this practice has almost been abandoned. Only the tenants or households with sufficient cultivable land at their disposal are still keeping some of their fields fallow for one year. Dependence on a single crop, however, is not feasible due both to the physical conditions and the households' fodder needs. These are the main factors determining present-day crop rotations in this village.

### 5.2.3 Modern Agricultural Innovations

In the last two decades some fruits of modern agriculture have reached this remote village.<sup>187</sup> In the early 1980s chemical fertilisers became available here at subsidised prices, as part of a government policy to popularise these modern inputs to increase crop yield. According to the local farmers, initially crop yield as well as straw production increased substantially, but the long-term results were not encouraging. This was due to the inappropriate government policies, as the local farmers were not properly trained for the usage and application of chemical fertilisers. They were and still are applying it without required knowledge and guidance. Later, after the withdrawal of the government subsidy, the chemical fertilisers became too expensive, especially for the remote villages (cf. HASERODT 1989: 120). The households in this village are literally unable to afford the required quantity. Moreover, the application of fertiliser on local crop varieties has proved in any case to be mostly counter-productive. Nevertheless, many households (65% of the total) are using chemical fertilisers for their far-off holdings, where a supply of manure is either difficult to obtain or insufficient. Similar to the usual practice in other parts of the Northern Areas (cf. PILARDEAUX 1998: 396), in Odier fertiliser is exclusively purchased from the local village shopkeepers, usually on credit, in quantities ranging from five to 50 kg per annum.

New and high-yielding seed varieties were also introduced in the village, partly by the villagers themselves borrowing from the neighbouring villages and partly by the agri-

<sup>186</sup> Similar changes in crop selection and cropping pattern occurred throughout the whole northern mountainous region of Pakistan. There are various factors responsible for agricultural transformations, including accessibility, market integration, modern innovations etc. For further details, see ALLAN (1984a & b, 1986b, 1987b, 1989 and 1990).

<sup>187</sup> Agricultural credit from Agricultural Development Bank of Pakistan (ADBP) and other financial institutions was neither easily available to the villagers of Odier and nor encouraged by them. This was mainly because of the general credit policy of the ADBP and other financial institutions (cf. PILARDEAUX 1997, 1998). Additionally, money lending system in the village was and still is well organised. It is without complex formalities and high mark-up rates. Furthermore, repayment to the creditor has always been flexible compared to the banks. As a result only six persons have received loans from the ADBP, in order to overhaul jeeps and establish businesses in the village. Of those, three were co-helpers or proxy.

cultural section of the AKRSP. As both grain and straw production are highly prized by the villagers, and the traditional crops yield more straw than grain, the new varieties are grown on a limited area only. The traditional variety of spring wheat (*basindi*) has now been partially replaced by modern seeds. After a successful harvest, the households in this village propagate these modern seeds further through a system of mutual exchange and borrowing.<sup>188</sup>

In the last decade, threshing machines were introduced in Odier. They became popular and are used for most of the threshing. In easily accessible and centrally located villages, tractor owners customarily offer their services and a little bargaining is also possible, but the situation in this village is very different. Here, altitude and uncertain weather conditions aggravate the village's relatively poor accessibility, and post-harvest damage is always imminent. In contrast to other villages with better locations, where the use of threshers has become an individual household activity (cf. PILARDEAUX 1998: 393), Odier has initiated a co-operative and collective strategy: The villagers have mobilised a system of communal labour, and threshing follows a predetermined turn system.

First the villagers properly invite the itinerant threshing-machine owners, through formal request. The threshing work itself takes about ten days, and the individual customers are charged for this service based on the duration of the job.<sup>189</sup> Because the roads are so roughly aligned, extra help is needed to bring the threshing machine into and out of the village. Therefore, the villagers are informed of the exact date of the thresher's arrival to ensure labour availability for pushing and pulling the machine. The groups of households responsible for maintaining the road are also notified, so they can improve the vulnerable road sections to ensure the easy passage of the threshing machine (cf. Chap. 5.7.1). Before threshing, the households usually collect all the sheaves from their fields and stack them up at suitable locations, accessible to the machine. The running of the machine is organised on a turn basis. When one household has its turn, the neighbours and relatives remain available to help out on a voluntary basis. In this way, based on neighbourhoods, at least one able-bodied male member of every household is present to assist his respective threshing group. The whole neighbourhood collectively feeds all the workers on this occasion.

In the meantime, the villagers have abandoned their general practice of collecting wild plants to be consumed fresh and stored. In the past, many wild plants were used as vegetables to compensate for the scarcity of food during the early summer season. They have been partially replaced by new vegetables, such as pumpkin; onions, peas, cauliflower and cabbage, that have now been introduced into the village. The main kitchen vegetable, however, is turnip, which is consumed fresh and also dried and stored for the winter season. The village's increasing accessibility has made it possible to import seed-

<sup>188</sup> Other researchers have also reported the propagation of new seeds through 'social channels' in the Hindu Kush and western Himalayan region, as well, e.g. ALLAN (1985a: 251).

<sup>189</sup> In contrast to this, in the lower part of Chitral and other areas with relatively better yield and productivity, the threshing-machine owners charge their customers based on production, i.e., a fixed amount of money per 100 kg bag of grain. Here, in case of this village/valley, both yield and productivity are very low; therefore, the households are charged according to time, i.e. a fixed amount of money per working hour.

lings from the lower-altitude villages at planting time. In particular, onion and tomato seedlings are available in the village around mid April. The village jeeps, which ply daily between this village and Chitral town, are used to purchase the seedlings and transport them to the village shops for sale. The local varieties of green and black beans are not consumed as fresh vegetables. Both these grains are milled, mixed with 10 to 20 percent barley, and made into noodles for soup. Sometimes, they are also boiled with wheat or maize in winter as an additional foodstuff.

#### 5.2.4 Heavy Dependence on Exogenous Food Supplies

In the early 1970s the government extended food subsidies to these remote villages. Initially most of the daily-used foodstuffs were supplied at subsidised rates, including wheat grain, sugar, rock salt, and cooking oil. Chemical fertilisers and kerosene oil were also subsidised, although, as already stated, fertiliser wasn't added to the list until a decade later. With the passage of time, the subsidies for almost all of these items were withdrawn. At present, wheat grain is the single and most important state-subsidised item for the remote localities.

In the beginning state-owned grain depots (godowns) were distantly located, and the village households were expected to transport their grain from the godown on their own. Later on, with the improvement of communication and extension of roads to the far-flung areas, new grain depots were also established in some of the villages. With the passage of time state-owned depots were gradually established closer and closer, finally arriving in the remote villages when the jeepable roads were extended in the late 1980s and early 1990s.

There are two types of grain depots. The big ones, located in the main villages, are constructed and maintained by the state; the smaller ones, popularly known as 'sale-points', are constructed and maintained by the village communities (cf. Chap. 5.7.3). At present, many small villages throughout the district have their own sale-points, where the state-subsidised grain is sold for cash payment. As a result, the yearly spring-season famine, which used to be a regular event throughout the whole Torkhow valley, lasting two to three months every spring, is at present quite unknown to the young people. Since 1992 small sale-points have been established in all the villages of Mehlp Valley and, with one exception, are still functioning smoothly today.<sup>190</sup> In Mehlp Valley there is no fixed amount of grain designated for the single sale-points; rather the amount is fixed for the whole valley, and the contractor concerned distributes it among the sale-points at his own convenience. Usually the village drivers, in consultation with the responsible contractor, are responsible for the carriage from the main godowns to the village sale-points.<sup>191</sup>

The system of subsidised grain supply is organised by the Food Department, working under the Ministry of Food and Agriculture. At the district level, a district food

<sup>190</sup> The Shoa sale-point was the earliest to be established in this valley, but it has been closed since 1999 due to some financial irregularities in the repayment made by the person in charge (*chokidar*). This man's outstanding debt is quite high – about Rs. 300,000 (ca. 4,280 €).

<sup>191</sup> One driver from Odier is also a registered C-class contractor in the Food Department.



controller (DFC) is responsible for the organisation and smooth functioning of the grain supply. At the tahsil level, junior officers popularly known as 'tahsil clerks' or 'godown clerks' assist the DFC. All transport charges of the food grain (wheat) are paid by the state, to keep the price under control in the remote and far-flung areas. The food department has regular contractors of various classes responsible for organising these transports.<sup>192</sup> From the railhead at Dargai in Malakand Agency NWFP, grain is transported by higher-class contractors (mostly A or B) to Chitral. Within the district there are other contractors who, upon selection, take responsibility for transporting the grain to all the storehouses and sale-points, according to the terms and conditions of the contract. The transportation charges are fixed for remote stations. For example, in Torkhow tahsil the main storehouses are located at Shagram (tahsil headquarters), Rech, Khot and Mehlp. The government offers equal carriage rates for Khot, Rech and Mehlp. Shagram is a little cheaper. The remaining villages, which are located below or around Shagram, get the same carriage rate as Shagram. A Food Department clerk posted at Shagram, in co-ordination with the DFC, is responsible to supervise supply and sale of grain at all storehouses and sale-points under his jurisdiction. All the government-owned storehouses have regular employees to look after the grain stock and the building, and to keep the godown supply and sale records. One person is likewise appointed by the village community to be responsible for the village's sale-point affairs, and he is popularly known as a 'sale-point *chokidar*'.

The tahsil clerk visits all the storehouses and sale-points regularly to update the sales records. He collects money from the responsible persons and deposits it in the state treasury. Sometimes he also receives visits from the sale-point *chokidars*, who come individually to deposit the money they have collected with him. The *chokidars* always maintain a record book of all incoming and outgoing grain at their sale-points, which the tahsil clerk updates on his regular visits. At the end of the year, the tahsil clerk draws up a detailed balance sheet for each sale-point, showing the number of grain bags sold, the money deposited, and the number of bags still lying in the depot.

Where in other valley societies in the Northern Areas, such as Yasin and Bagrot, the consumption of wheat flour is substantially high (cf. DITTRICH 1998: 288), the inhabi-

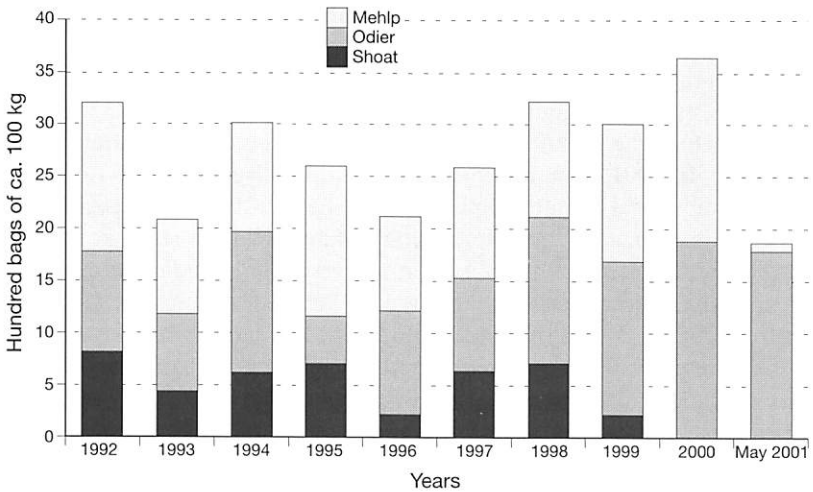
<sup>192</sup> These are registered contractors of different classes (A, B and C), working with various government departments, such as the Public Works Department (PWD), Civil Work (C&W), Water and Power Development Authority (WAPDA), Public Health, Irrigation and Food Department etc. These contractors are sorted into three classes, based on their personal finances and how many vehicles they have at hand, to carry out projects of different values. For example, to become a C-class (lowest in the hierarchy) contractor in the Food Department, a person must own two small-sized vehicles (in this case, jeeps) and have a sum of Rs. 100,000 in his personal bank account at the time of application. Afterwards the contractor has to renew his contract every year by paying a fixed amount of money to the state. The registered contractors are eligible to offer their services by bidding for the tender rates advertised by the respective departments for the specific work. In these advertisements, the concerned government departments set an upper limit on the amount of money to be offered for the work. The contractor or group of contractors, who offers the lowest rate for the said work or carriage etc., is selected and made responsible to complete the job in the stipulated time period. The money is paid to the contractor in different instalments, according to the progress of his work (personal communication with MOHAMMAD QADIR MIRZA, Chitral 2002).

tants of Mehlp Valley are exclusively dependent on the subsidised wheat grain to fulfil their staple food requirements. Wheat consumption in the valley has been fluctuating since 1992, but the general trend shows a steady increase (Fig. 5.2).<sup>193</sup> In the meantime, the price of the subsidised grain has also increased fourfold, from Rs. 2.22 per kg in 1986 to Rs. 8.16 per kg in 2001. A substantial cash income is now required to bridge the hunger gap. In 2001 alone, the households of this village spent Rs. 1.4 million (ca. 20,000 €) for subsidised grain to compensate for the ever-increasing deficiency of food (Fig. 5.3).<sup>194</sup> The average grain consumption of a household was about 1,470 kg per year, and Rs. 12,000 were spent on it. That is a very high amount compared to what is spent on grain in other areas (cf. HASERODT 1989: 122; KREUTZMANN 1993b: 30; PILARDEAUX 1998: 373 and STÖBER 2000b: 242). This figure also does not take into account how much is spent for other domestic needs, such as black tea, vegetable oil, sugar, rice etc., and all other non-food items, all of which are exclusively imported from the lowland.<sup>195</sup>

<sup>193</sup> Although the collected data shows exact figures for the numbers of grain-bags sold by the *chokidar* of the Mehlp Valley sale-points and the money deposited by them with the tahsil clerk, there are still many discrepancies. For example, the drivers responsible for the carriage of the grain sometimes sell the grain in localities close to Chitral town or somewhere earlier en route to their original destination. They then deposit the money with the *chokidar* of the sale-point for which the carriage was originally intended, and thus the drivers get their transportation charges covered for free. Secondly, the sale-point *chokidars* also sell some grain on credit. Because this is not officially allowed (cf. DITTRICH 1997: 34, 1998: 311), these figures are not included in the sales list. This type of credit is difficult to calculate, since the price of wheat changes according to government policies, and the creditor is expected to pay the actual price at the time of payment. Both of these practices are strictly prohibited; nevertheless these activities are very common and going on at every level of the wheat-carriage system. For these reasons, the collected data is neither consistent nor reliable. However, it does clearly show the increasing trend in both grain demand and money spent on it. Another pertinent factor is the occasional increase in grain price. The government announces this price change, and the concerned persons are directed to deposit the money from previously sold grain in the state treasury within a stipulated time. In response to this, all the tahsil clerks and sale-point *chokidars* often deposit more money than was actually collected in the state treasury, in order to receive personal benefits.

<sup>194</sup> The hunger period (a deficiency in food production compared to consumption) in the Himalaya, Hindu Kush and Karakorum regions of Northern Pakistan has increased from between two to four months in the 1970s, to between six to eight months in the 1990s (STREEFLAND, KHAN & LIESHOUT 1995: 90). This has to be compensated for through purchase; and that obviously needs cash, which is earned elsewhere, through the 'export of labour' (cf. SCHROEDER 1985: 39).

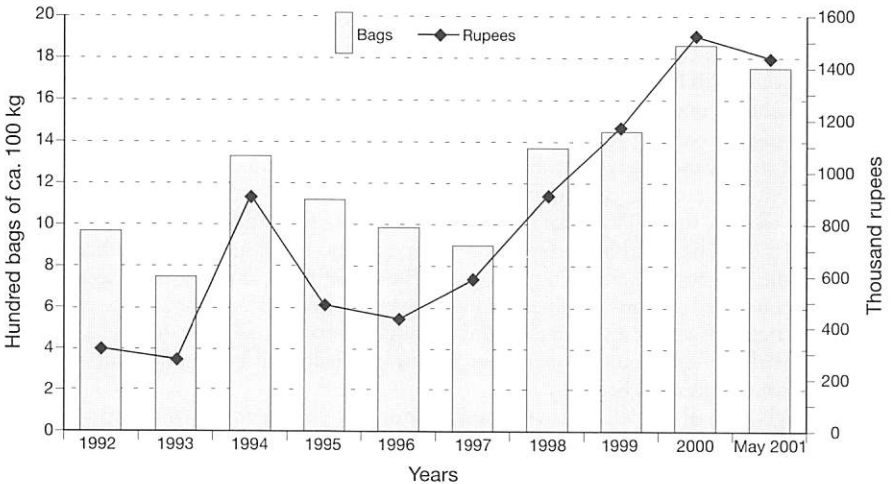
<sup>195</sup> Data collected from the households shows that a family of eight members consumes about 24 kg of black tea per year. In 2001 its price was Rs. 200 per kg. Additionally, the average household size is above 9! According to ALLAN (1985a: 250), 45 percent of the total sales in the local bazaars comprise clothing, rice and kerosene.



Source Data collected from the sale points of Mehlp Valley in summer 2001

**Fig. 5.2 Yearly Sale of Subsidised Wheat in Mehlp Valley (1992-2001)**

In general, the consumption of subsidised wheat increased not only in Mehlp Valley, but also in the whole North West Frontier Province. To bridge the gap, the government increased the grain quota for the province from 124 kg per head per annum to 140 kg per head per annum (THE MASHRIQ, May 12, 2000).<sup>196</sup> Following the WHO standards, BOHLE & ADHIKARI (1998: 324) estimated 180 kg of cereal (about 1,650 calories) per head per annum as a minimum food requirement. This means that the



Source Data collected from sale point Odier, summer 2001

**Fig. 5.3 Yearly Sale of Subsidised Wheat in Odier (1992-2001)**

<sup>196</sup> The wheat-grain subsidy for Chitral district costs the national exchequer Rs. 60 million (FAIZI 1999: 14). This amount is set aside from the annual development fund of the district. Whereas, in case of the Northern Areas the federal government is spending Rs. 740 million for the supply of subsidised wheat (THE DAWN, September 23, 2003).

inhabitants of NWFP are producing only 22 percent of their yearly cereal requirements and the rest is imported to fill the gap.

Aside from the state-owned and subsidised grain supply, the village shops provide most of the basic food items, including rice, sugar, black tea-leaves and cooking oil, along with a variety of other food products. The number of shops in this village has increased considerably in the last decade. According to DITTRICH (1997: 31), this indicates decreasing food availability at the local level for subsistence, and increasing dependency on the lowland. According to GRÖTZBACH (1984), on the other hand, this rapid development of commercial enterprises in Chitral and Gilgit is the result of an increasing availability of cash coming from the lowlands through remittance. This in turn has been created by the non-availability of jobs within the mountainous region and the resultant pattern of out-migration. Moreover, the variety of items offered by these village shops also manifests food-consumption patterns and availability of cash, although most of the business (almost 80 percent) is conducted on credit without time limits.

In this village, the area under fodder crops and plantations has increased substantially. This is due to the ready availability of food grain on cash payment, and not because of the under-utilisation of pastures as reported in the case of Astor and Punial (PILARDEAUX 1997: 49). Despite modern innovations, animal husbandry still plays an important role both as a supplementary contributor to the domestic economy, as well as for agriculture. At the same time, since fodder is not available in the markets either in sufficient quantity or at an affordable price compared to food grains and other food products, fodder crops are given priority. Consequently, in Odier the traditional agriculture is mainly focused on fodder crops, irrigated pastures and plantations. This obviously results in a 'fodder-determined cropping pattern' (cf. WHITEMAN 1988: 75), and the cropping-pattern and land-use data collected from the village in 2001 clearly reveal this type of land utilisation and farming activity (cf. Chap. 3.2.6, Map 3.1 and Fig. 3.8). However, a sevenfold increase in the area under fodder crops from 1991 to 1997 (cf. AKRSP 2000: 29, Tab. 4.7g) seems to be an overestimate of the situation in Chitral!

### **5.3 Changes in Animal Husbandry**

A major characteristic of animal husbandry in the high-altitude villages is the diversity of livestock kept by a household. This strategy was adopted for a variety of reasons, one of which is risk mediation (cf. NING 1997: 73 and MACDONALD 1998: 298). According to CONWAY (1987: 105), diversity of cultivars and animal species at a farm level is considered a precondition for sustainability. Traditional animal husbandry (cf. Chap. 4.3) is an important subsistence strategy and comprises a system of sustenance security in high-mountain environments (cf. NÜSSER 1999). In this context, the animal husbandry practised in Odier has thoroughly changed in response to other changes in the overall society and habitat conditions. In a situation of socio-economic integration and transformation of the traditional systems, it is important to examine how a society readjusts itself to such changes. It is necessary to have this kind of overview in order to understand the mechanisms these village communities have adopted at the micro-level to mitigate the negative effects of modernisation.

*“Neither nomadism nor combined mixed mountain agriculture appear to be archaic surviving practices. Both are undergoing regular changes, modifications and adjustments. Especially the dynamic adaptation to a transforming socio-political environment and the powerful incorporation into a supra regional market structure needs attention when in the discussion of sustainable development the search for a role model is too often oriented along ecological conditions alone. The neglect of economy and society contributes to the presentation of a somehow distorted representation of pastoral practices. The attention towards animal husbandry and its role in high mountain agriculture is rather challenging as the research about this sector seems in need for more complex approaches and historical depth.”* (KREUTZMANN 2000a: 91)

For the last 20 to 25 years, the whole mountainous region of Northern Pakistan has experienced both transformations and adjustments in animal husbandry. The total number of livestock in a village and its composition, which animals each household owns, as well as grazing arrangements and pasture utilisation have all shown considerable changes, varying in intensity from valley to valley. At the same time, the driving forces responsible for these changes differ from locality to locality, depending on biophysical, cultural and economic factors (cf. EHLERS & KREUTZMANN 2000a).

Most of these changes and societal adjustments can be easily observed at local levels. In Odier, for instance, not only has the number of livestock changed, but also new grazing arrangements have been introduced. One of the grazing groups in this village has totally collapsed, as most of the group members have sold their goats. Moreover, the extent of changes in animal husbandry here can be assessed from the fact that the villagers who in the recent past were earning substantial income by looking after others' sheep and goats during the summer season are now regularly paying cash to hired labour for the same activity. In this village these changes in the traditional animal husbandry have developed within a period of two to three decades.

### **5.3.1 Changes in Livestock Ownership**

Unlike the relatively minor changes in the areas around Nanga Parbat (CLEMENS & NÜSSER 2000: 170), drastic transformations in animal husbandry have been observed in all the villages of Mehlp Valley. Agricultural innovations together with unavailability of a suitable labour force, due to school attendance and large-scale seasonal out-migration, are the main factors behind these transformations. Simultaneously, the availability of industrial products from the lowland at relatively cheap rates, as well as chemical fertilisers, has also undermined animal husbandry to the some extent. The introduction of plastic shoes, cotton and synthetic cloths, blankets, and cotton and plastic ropes has greatly reduced the importance of indigenous handcrafts. Although wool and hair are still locally processed for making domestic products (cf. Chap. 4.3.3), today some of the locally available raw materials are sold to itinerant traders without processing. Due to these new trends, both the cottage industries as well as traditional skills are in danger of extinction. According to BAIG (1997: 154):

*“...whereas the Kho women have neglected many of their traditional duties including cottage industry from wool. [Consequently] Some of the old skills have already*

*been forgotten while others are on the verge of it and hence a part of our culture is in danger.”*<sup>197</sup>

Today sheep are shorn twice a year rather than three times, as in the recent past. The number of cattle has decreased, as threshing machines have become popular in this village. Nevertheless, oxen are still needed and important for ploughing the fields, as seasonal conditions, topography and access to the fields do not favour tractor use in the village.<sup>198</sup> Threshing is also done according to the traditional methods in the summer settlement. The amelioration of grazing land within the village and in the surrounding areas has not only reduced the seasonal grazing opportunities for sheep and goats, but also considerably stressed summer-season haymaking. As a consequence, those households with relatively low area under fodder crops and irrigated pastures are now unable to keep as many livestock as in the past.

Since the 1980s the combined effects of all these factors have been strongly felt in the village and the response from the households was quite logical. The number of animal species demanding more out-door seasonal grazing, mainly in winter, has substantially decreased. For example, in the late 1980s there were 26 yak-owning households in Odier, with a total of 65 head of yaks.<sup>199</sup> By the year 2001, the yak owners had decreased to only two households, and the number of yaks had correspondingly decreased to only five heads.<sup>200</sup> Similarly, during the same period there were originally only seven households without goats in this village, and now that has increased to 68 households, or 56.7 percent of the total. In contrast to the situation in this village, the number of goats increased in the Rupal valley, Astor subdivision and Punial tahsil of Ghizer district (cf. CLEMENS & NÜSSER 2000: 161 and FISCHER 2000a: 67). Although new grazing arrangements established in Odier in 1999 also encouraged many households to start keeping goats again, still the number of goat owners is relatively low compared to the 1980s (cf. App. 1.4). Consequently, different neighbourhood and village organisations associated with animal husbandry (cf. Chap. 4.3.2.2 & 4.3.2.6) automatically ceased functioning. On the other hand, with the number of households increasing, the total number of livestock in the village increased as well. All households keep a few animals for urgent domestic needs and reciprocal exchange with their in-laws, as well as to ensure milk availability and the reproduction of animal species (cf. Chap. 4.3.3.1).

<sup>197</sup> Other researchers have made similar remarks on the on-going transformations of the Kho society as well, e.g. FAIZI (1996a) and MEYER (2000: 22f.).

<sup>198</sup> It is relatively easier to use a thresher than a tractor, because it is much easier to assemble the sheaves in a more accessible place. Secondly, during the threshing season most of the fields are without crop, so it is easy to make temporary passages for driving the thresher to suitable locations. Ploughing with a tractor is difficult as the fields are small and sometimes have very steep slopes. Likewise, in spring the whole village is cut off from motorised traffic due to snow cover (cf. Chap. 5.7.1). In such circumstances, driving a tractor to the fields is not only difficult, but in many cases even impossible.

<sup>199</sup> According to ISRAR-UD-DIN (1965: 160a) there were 100 yaks in Mehlp Valley. Later on, HASERODT (1989: 125) reported 200 head of yaks from Mehlp Valley. However, this number had decreased to only 13 head in 2001.

<sup>200</sup> Contrary to the situation in this village, in recent years the number of yaks has considerably increased in Hunza valley (cf. KREUTZMANN 2000e: 372).

The establishment of schools in the 1970s and increasing importance of education in the village resulted in a shortage of labour for tending livestock. To adjust animal husbandry to the scarcity of labour force at the household level, during the summer season the sheep and goats were put together for rotational turn grazing for about three months. For the remaining period, sheep were grazed in the village with the milk cow (cf. Chap. 4.3.2.1). The labour shortage at the household level was also further exacerbated by the disintegration of joint families and seasonal out-migration (cf. Chap. 5.5.2.2). Since most of the nuclear families were unable to provide the required labour force, in the 1980s the combined grazing period of sheep and goats was extended to about six months. This practice was maintained for a long time in the village, until the villagers starting hiring shepherds for regular payment in 1999.<sup>201</sup>

Meanwhile, the old tradition of seasonally looking after the sheep and goats of the neighbouring villages as a source of extra income (cf. Chap. 4.3.2.4) has totally died out in the whole of Mehlp Valley. The households that were once dependent on this system have introduced the practice of hiring nomadic *Gujur* as paid shepherds. Initially they recruited nomadic *Gujur* on a contract basis for summer-season grazing only (NÜSSER 1999), and the respective households resumed the traditional system of turn grazing during the winter season. With the passage of time, however, except for a few cases, the nomadic *Gujur* have taken up the daily grazing on a permanent basis throughout the year. Slowly and gradually this system of hiring *Gujur* spread throughout the whole Torkhow tahsil, and in 1999 it was also introduced in Mehlp Valley.<sup>202</sup> Since then this system has been functioning quite successfully in two villages of this valley, namely Shoat and Odier. In Mehlp proper, the traditional system of daily turn grazing is still operating unchanged, but the number of goat- and yak-owners has drastically decreased in this case also.

### 5.3.2 New Grazing Arrangements for Sheep and Goats

As it is mentioned earlier since 1999 the villagers have changed the daily grazing arrangements for mixed herds of sheep and goats. The rotational daily grazing has practically stopped in the case of the two grazing organisations in this village that graze their sheep and goats together. These two groups are now employing nomadic *Gujur* under particular terms and conditions for this job. These two *Gujur* regularly take care of the daily turn grazing of sheep and goats year round. On the occasion of collective seasonal movement (cf. Chap. 4.5.1), the households of the two groups take their own *Gujur* with them to the upper part of the village and summer settlement. In each case, there is an organising committee comprised of five members of the grazing group, whose job is to streamline the day-to-day affairs and to work as liaison between the commu-

<sup>201</sup> Similar constraints of labour shortage for animal husbandry resulted in the introduction of the turn grazing system in Yasin valley (STÖBER 2000b and STÖBER & HERBERS 2000).

<sup>202</sup> Unlike these general trends in the Torkhow area, according to FAIZI (1999: 15) some villagers in the 'upper subdivision' [Mastuj subdivision] also employed Afghan refugees for grazing livestock. They were also given utilisation rights over the communal pasture. Moreover, according to Farid Ahmad (personal communication, Chitral 2003), in one village of Torkhow tahsil (Washich) following the *Gujur* principle, a local man has been hired by the villagers to carry out year-round daily grazing of sheep and goats.

nity and the hired shepherd – the *Gujur*. Three small huts have been constructed for the *Gujur* as residences, one each in the lower and upper parts of the village and the summer settlement. The system of payment, along with other conditions for both the winter and summer seasons, is finalised through a regular contract with the *Gujur*. The *Gujur* usually own their own sheep and goats, and since they are outsiders, they have no access rights to the pastures of this village; therefore, part of the agreement is that they are allowed to graze their herd on the village's communal pastures as it is practiced elsewhere in Chitral (cf. NÜSSER 1999: 119). They are also allowed to collect firewood from the reserved pastures (cf. Chap. 3.4.4.1) of the village for cooking purposes during the summer season.

According to the agreement of 1999, the households benefiting from the *Gujurs'* services are paying Rs. 40 per household per month, together with four *bati* (about 10 kg) of wheat flour during the summer season. The arrangements for winter season are a little bit different, since the *Gujur* have to feed their own herds and have no possibility of collecting firewood for cooking and heating. Therefore, the benefiting households also contribute two bundles of firewood and four bundles of grass or alfalfa along with the above-mentioned monthly honorarium of Rs. 40 and wheat flour. Additionally these households, on a turn basis, provide their *Gujur* daily with a moderate-sized loaf of thick bread made of wheat flour.

The *Gujur's* duty is to take the sheep and goats (or only goats, according to the season) from the owners in the morning, graze them for the whole day and bring them back to the village in the evening. In case of an emergency, he has to inform the group at least twelve hours ahead of time, so that alternative arrangements for the next day can be arranged. In such circumstances, the old pattern of daily grazing on the turn basis is reactivated and the relevant person is notified to resume his duty.

During the daily grazing the *Gujur* also has to look after the animals. In case an animal is injured or falls seriously ill, he has to slaughter the dying animal properly and bring it down to the village. If he is negligent in any of his duties – especially the slaughtering of a dying animal – he is responsible for compensating the concerned household. Generally the contract is made only for one season, i.e. for about six months; a further extension of his contract depends on the *Gujur's* satisfactory performance of his service. Upon successful completion of the initial six months, the contract is then extended for an indefinite period. In case of a death in a *Gujur's* family, they are treated as members of the community, and the whole community carries out the burial and other arrangements. Moreover, he will be released from his duties for a minimum of three consecutive days.

#### 5.4 Changes in House Design and Construction

Many changes have also been made in the settlement structures, in particular the traditional one-room house (*khowar khatan*). This traditional structure has remained unchanged in its design and layout for a relatively long time. It has always consisted of a single room without any windows or ventilation, with animal sheds, hay stores, a byre and a storeroom attached to it on one side. The access to the house was through a corridor, called *dahlenz* that traditionally had two doors – an outer and inner one



(cf. Fig. 3.10). All the facilities were (and still are) under the single roof, ranging from kitchen and sleeping area to wood storage and the storage of agricultural implements (cf. Fig. 3.9). Another addition to these one-room structures was a small bathroom that was sometimes attached to the house. The only exceptions were the houses of the well-to-do families in the region, in this case the *adamzadas* or state officials, who always had separate houses for their guests and visitors. The poor households had no tradition of separate guestrooms: guests usually shared the same space with the host.

The old one-room houses were constructed without any imported material. No nails were used, and the doors were made out of two or three wooden planks joined together with wooden pegs. There were no hinges; rather, small projections from the upper and lower edges of the door were fitted to revolve in sockets in the doorframe. In the absence of locks for closing the doors, locally made keys were used in the whole village. The old method of closing and opening the house door has been vividly described as follows:

*“The door can be fastened by a heavy wooden bolt on the interior. This bolt can also be operated from the outside by means of a ‘key’, a long curved piece of wire which is inserted through a tiny hole in the door 2 ft. or so above the level of the bolt. The distance from this ‘keyhole’ to the bolt on the interior is different in every case, as is the position of the handle on the bolt on to which the end of the key is applied. Only the correct key will fit and allow the bolt to be worked from outside.”* (HUSSAM-UL-MULK & STALEY 1968: 107)<sup>203</sup>

Today, motorised access to the regional centre and availability of money have resulted in modernisation of the building materials. Cement, deodar wood and corrugated iron sheets for the roof are some examples of modern innovations that have been introduced in the village. Nevertheless, the traditional design of the house has remained largely unchanged.

In the early 1950s, some guesthouses were introduced in the village, as in other parts of Chitral (cf. ISRAR-UD-DIN 1966, 1984). These guestrooms were the first new development to the normal family house. They were constructed either away from the house or attached to it, depending on the local circumstances. These roughly crafted structures had a smoke hole constructed in the wall, but in this village they were still without glass windows and hinges. Small wooden shutters (*chalakhduri*) were added to the structure following the above-stated methods of door placement. Even the mosques were designed in the same way, with an additional bit of fine finishing, and were whitewashed.

In the guestroom a fireplace was constructed in the wall, and a chimney was raised on the roof of the room above the smoke outlet. Two separate doors joining each other (*chovkat*) – in the early days with fairly elaborate wooden carvings – and closing with hinges, handles and iron hasps were introduced for the first time as part of the structure. In the late 1970s and early 1980s glass windows with a protective iron lattice became popular, and ventilation holes were also built into the structures. In the 1990s cement and corrugated iron sheets became popular building materials, mainly for the

<sup>203</sup> The same method for closing and opening house doors has been reported from Kafirstan (cf. ROBERTSON 1896: 485f.).

guesthouses. The insufficiency of local timber and availability of money resulted in the import of deodar wood from lower Chitral. In the meantime, similar to Rupal Valley (cf. CLEMENS 2001), iron stoves with long pipes as smoke outlets were introduced and replaced the built-in chimneys in the newly constructed guest rooms. Simultaneously new carpets and rugs were imported from the lowland to spread over the floor of the guestrooms. The guestroom ceiling also changed, following new trends in public buildings. The floors are now made of concrete, and sometimes the doors, windows and ceiling are also painted. The walls are usually whitewashed with a limestone solution. Carpenters are usually hired from outside the village for the construction of these guestrooms (see below).

Over time, the design and layout of the single-room house was also modified to some extent, due both to the scarcity of timber and the need to accommodate new structures for the young family members. The size has now been reduced and the ground plan modified. The sections reserved for wood storage inside the house (*shom* and *shung*), and the sitting area (*pherwano*) are now considerably reduced in size compared to the old design (cf. Fig. 3.9). The traditional house used to have two fireplaces; one just below the roof opening and the other, a bit lower, attached to the former. On special occasions, both fireplaces were used simultaneously for cooking food. The introduction of large round-shaped and moveable iron stoves for the living room, with cooking facilities, also changed the traditional fireplace and other associated structures. Now the old *didago tek* attached to the lower fireplaces (cf. HUSSAM-UL-MULK & STALEY 1968), has been removed, and its place has been incorporated as part of the *pherwano*.

The introduction of the new stoves has considerably increased the firewood consumption in the village. Most of the locally available firewood is light and burns very rapidly, and these stoves must be continuously alight to keep the room warm. On the other hand, the problem of smoke accumulation in the house, especially during the winter months, has been solved with this innovation. The sleeping sections (*nakh*) have still been maintained on both sides of the house, with changes in their length and breadth. In the newly constructed houses the storage bins (*kash*) have also been replaced with aluminium boxes or other storage facilities imported from the lowland. Again, this is due to the local unavailability of suitable construction material for these bins. The access corridor has been thoroughly replaced by verandas, which are also used for sleeping during the summer season. Thus, the whole ground plan has been modified to conserve timber and firewood.

Another change that has been observed is in the access to the animal quarters. In the past there was a direct access through a door between the living room of the house and the animal section. This has now been changed in many ways. In some cases, a door leading to this section has been opened in the attached storeroom; in other cases it is accessible through the lower section of the house, depending on the layout and plan of the whole structure. But most of the households have not yet adopted this change in their construction of new houses, due mainly to the harsh environmental conditions – with the old design, the inhabitants need not go outside to reach the animals. In front of this door leading to the animal sheds from the house there was and usually still is a small square-shaped structure, which is used during the winter season for keeping

newly born kids, calves and lambs, as well as tending weak and sick animals.<sup>204</sup> It is very easily erected with the addition of a small wall, about one metre in height, leading from one corner of the storage bin to the main house wall (cf. Fig. 3.9). Due to the new trend in changing the access to the animal section, however, this structure is no longer included in some of the newly constructed houses.

A major transformation has been observed in the number of settlement structures and built-up areas in the village. Although even nowadays, only less productive land is used for house construction, the number of houses and other structures has substantially increased with the advent of the nuclear family unit in the village. This has resulted in the occupation of new sites around the old neighbourhoods, and due to the resulting congestion, it has become difficult for the households to visit the open-air toilets. Because of this, modern toilets, which were usually attached only to the guestrooms, have now become a necessity, and more than 50 percent of the households have constructed these semi-modern toilets. At the same time, the inhabitants also developed a new sense of privacy, causing them to give up some of the old practices. For instance, sleeping on the rooftops of the houses during the summer season has slowly and gradually been abandoned. Only young, unmarried boys still sleep outdoors in the open air during the summer season. In a few cases, mostly in the summer settlement, this old system is still practised.

Some other new developments in house construction have been reported. In the past the local carpenters were not paid according to the number of days or hours they worked. Rather, after the completion of the house something in kind was given to them. The payment in kind (*phalaki*) was mostly inexact, worth only approximately, a little more or less than, his work. It usually consisted of a sheep, goats, grain, a standing poplar or willow tree, cattle, or arable land etc. according to what the customer could afford and the needs of the worker. The carpenter was hosted with good food, and the customer performed most of the carpenter's domestic work during his engagement. The overall work was rough in quality, and only locally available implements – mainly adze and axe – and techniques were used. Today the carpenters are paid for their work, up to Rs. 250 per day. They are also still provided with good meals. The local carpenters are hired for the construction of houses and normal guestrooms. For the former, no special care is taken with respect to the decoration and woodcarving that were sometimes included in the past. The important considerations today are the strength of the beams and roof-supporting pillars. For the construction of standard guestrooms, highly skilled professional carpenters are brought in from outside the village and given higher payments. The doors, windows and ventilators are now made in the sawmills at Chitral town, on prior order. These are then transported to the village and installed there by the carpenters.

The co-operative construction of houses (cf. Chap. 4.6.5.3) is now no longer practised in this village, but has been partially replaced by paid labour. For this work, a few households have hired Afghan refugees, but others assign this work to their close relatives and local villagers for a fixed amount of money. These changes can be attributed

<sup>204</sup> This structure (*shi*) [*shokal*] was commonly attached to the traditional houses in the upper Chitral for the same purpose mentioned here (cf. SCHOMBERG 1938: 223).

to two interrelated factors: the transformation of the village economy from barter to cash, and the long-term absence of many households from the village. The former is the outcome of regular payment for different services in cash, and the latter resulted in a breakdown of the traditional communal approach to reciprocity. It became difficult for those households working most of the time outside the village to participate in the reciprocal exchange of labour and other activities taking place in the village. Since they are not available to help the others with their projects, there is no point in their expecting the others to give them free labour. In any case, the system of reciprocal labour exchange is under huge stress these days, as more and more young people are leaving for off-farm jobs, either joining the seasonal wage-labour force or migrating to the Gulf States (cf. Chap. 5.5.2.3).

## 5.5 Transformation of the Village Economy

The traditional system of barter, reciprocity and exchange of products has totally changed, and money has become the single means of transaction in the village. Most of the reciprocal activities of labour exchange and organisational arrangement have either ceased to work or become extremely weak. For example, the practice of turn-based rotational grazing of sheep and goats and threshing with animal teams (cf. Cap. 5.2.3. & 5.3.2) has in some cases ended here; for both of these services, money has become an absolute prerequisite. The development of commercialisation in traditional societies usually leads to disparities: it increases the gulf between the 'haves' and 'have-nots', and also distorts the traditional division of labour. Moreover, this process has profound and multiple impacts not only on reciprocal-exchange behaviour, but also on the traditional resource management systems. The following argument of Kenneth Ruddle highlights the effects of this process on traditional societies:

*"The commercialization and monetarization of formerly local and mainly subsistence or reciprocal exchange or barter economies, which now link them with external markets ... 'leads' to the breakdown of traditional management systems through the weakening or total collapse of traditional moral authority."* (RUDDLE 1993: 1, cited in MCCAY & JENTOFT 1998: 26)<sup>205</sup>

<sup>205</sup> These negative trends in participation in neighbourhood- and village-level co-operative activities have been confirmed through empirical findings from Yasin valley (cf. STÖBER 2000b: 253). For similar findings in other localities in the Hindu Kush, Himalayan and Karakorum region, see also IVES & MESSERLI (1989: 182); ISRAR-UD-DIN (1996); MACDONALD (1996: 359); ROOHI & JERABKOVA (1997); HOLDSCHLAG (2000: 135) and HALVORSON (2003: 273).

During the late 1980s the increasing accessibility of this village to motorised traffic changed many things. The ensuing regular connection to the outside world enabled the villagers to avail themselves of some basic facilities. Since then it has become easier to get medical check-ups and treatment from the state-owned hospital and private clinics in Chitral town, particularly for the women.<sup>206</sup> Moreover, a high degree of dependence on imported foodstuffs, including daily-use items, and use of agricultural machinery has also increased the need of cash income (cf. Chap. 5.2.3 & 5.2.4). Meanwhile, the domestic production of both food and other daily utilities has drastically decreased; consequently the dependence on the market has increased substantially. Moreover, the price of the daily-use items, including food, also increased many times from 1980s to 2001. This was due to several interrelated factors: the increasing cost of power and energy, structural reforms initiated by the World Bank and International Monetary Fund (IMF), and the recurrent devaluation of Pakistani rupees (cf. DITTRICH 1997, 1998). The introduction of both new and second-hand warm clothing in the market has badly affected the value of locally made woollen robes. Due to the new trends, the locally manufactured woollen cloth, once very famous for its fine quality (GENERAL STAFF INDIA 1928: 50 and SCHOMBERG 1938: 146), was unable to compete in the market and lost its value. Presently, the most popular and fine-quality woollen cloth is manufactured in Lutkoh valley, located in Mogh and Mulkhow tahsil in Kosht. It is predominantly used for caps, waistcoats, coats and *chogha* and is also exported to the lowlands. Additionally, most of the woollen cloth manufactured in industries located in Lahore and Swat are also available in the markets (cf. FAIZI 1996a: 448). Other local varieties are unable to compete with these products in the market. Consequently, the community's dependence on cash and off-farm sources of income has increased tremendously.

Tab. 5.1 Odier: Clan-wise Migration Pattern and Off-farm Income Sources

| Clans    | Regular Cash Income | Retired from State Services | Working in the Middle East | Returned from the Middle East | Seasonal Labour Migrants | Educational Migrants | Engaged in Business |
|----------|---------------------|-----------------------------|----------------------------|-------------------------------|--------------------------|----------------------|---------------------|
| Bulay    | 9                   | 4                           | 12                         | 2                             | 20                       | 7                    | 2*                  |
| Khushay  | 4                   | 0                           | 0                          | 1                             | 2                        | 2                    | 1*                  |
| Nasketek | 6                   | 1                           | 2                          | 1                             | 5                        | 3                    | 0                   |
| Shadeyay | 1                   | 1                           | 2                          | 0                             | 4                        | 0                    | 1*                  |
| Shaipay  | 8                   | 2                           | 8                          | 2                             | 17                       | 7                    | 2*                  |
| Somalay  | 18                  | 8                           | 12                         | 8                             | 53                       | 5                    | 3                   |
| Total    | 46                  | 16                          | 36                         | 14                            | 101                      | 24                   | 9                   |

\* One person outside the village

Source Author's own survey, 2001

<sup>206</sup> Before the jeepable road was extended to the village, it was very difficult to take patients to hospitals for medical treatment. Very few women (excluding those married outside the village) had travelled beyond the village limits. Now, women are often seen travelling in the local jeeps, mostly for medical treatment. They benefit from the local vehicles that regularly ply between the village and Chitral town.

### 5.5.1 Limited Opportunities for Off-Farm Income Sources

The remote and peripheral location of Odier village (cf. Chap. 2.1.1) greatly restricts the inhabitants' opportunities for earning cash. The sale of surplus agricultural produce and animal products is irregular, with seasonally fluctuating prices (cf. Chap. 4.3.3.4). Positions available in the village itself are minimal. In the government sector, there are only two teachers and an assistant in the primary school.

There are six small shops in the village, and four persons earning regular cash income in the transport sector as drivers.<sup>207</sup> Some of these shopkeepers and all of the drivers are men who have returned from the Middle East and started businesses in the village. At the same time, they are also working on their arable lands as farmers. Also, the old antimony mine in the vicinity of this village was reopened in 2000, and a total of 10 persons (two from this village) are doing extraction work there for daily wages. Altogether, domestic production is hardly sufficient for four to six months of the year and job opportunities in the village are severely limited. In such a situation, the only possibility of earning cash is to leave the village. Thus the number of villagers participating in different types of seasonal and long-term out-migration to the lowland urban centres and elsewhere is steadily increasing with the passage of time (Tab. 5.1).

### 5.5.2 Changing Trends and Patterns of Male Out-Migration

Migration from the remote villages of Mehlp Valley to the regional capital and surrounding areas is not a new phenomenon. It has persisted throughout the whole political history of the former state, in different forms and levels of intensity. The causes of out-migration, as well as the migrants' destinations, were variable, corresponding to the political evolution in Chitral (cf. Chap. 2.3.3). However, during the *Mehtar* period (cf. Chap. 2.2.2) the common people were not allowed to travel outside the state (BAIG 1997: 139) and according to ISRAR-UD-DIN (1965: 52), "the upper class was [even] hostile to any movement of this sort [out-migration] on the part of the poor."

<sup>208</sup> This state of affairs has now totally changed, and since the creation of Pakistan out-migration from this state to the outside world has multiplied. As distant destinations became accessible as a result of improvements in communication, the out-migration has become increasingly economic oriented. In the late 1960s the 'export' of labour was considerably high, and according to STALEY (1969: 241), one man from every second household participated in the winter-season out-migration. With the passage of time, out-migration has become one of the main sources of cash income for the whole northern mountainous belt of Pakistan, including Chitral district (SAUNDERS 1983; GRÖTZBACH 1984; HASERODT 1989, 1996; KREUTZMANN 1989, 1992, 1993b, 1995a, & b; HERBERS 1997, 1998; HOLDSCHLAG 2000 and STÖBER 2000b, 2001).<sup>209</sup>

<sup>207</sup> Additionally, a few households in the village are selling tea, rice, sugar and a few other items without opening a regular shop. The difference between these 'house-shops' and the regular shops is that the latter offer a wide variety of daily-use items, including food products.

<sup>208</sup> Similar restrictions on travel have been reported from other principalities in the Karakorum region, e.g., Hunza valley (cf. ALLAN 1986a: 86).

<sup>209</sup> Contrary to this general trend at the regional scale, according to BAIG (1994: 129) seasonal out-migration from the upper Ghizer district was almost negligible. MACDONALD (1996) made similar observations for upper Braldu valley, Baltistan district.

Since the early 1990s some new trends in population movement can be observed in the villages of Mehlp Valley. Despite increasing emigration from this valley, some immigration has also taken place (Fig, 5.4). The most recent out-migration from this village has various forms and a variety of patterns. The general duration of the outside stay and the migrants' destination depend on the purpose of their out-migration. The following sections detail the different types of out-migration that have been identified in Odier village, based on these two characteristics: duration of stay and destination.

### 5.5.2.1 Employed Migrants: Source of Cash and Helpers in Farming Activities

These migrants work mostly as permanent employees in government services. They are away from their families most of the time, posted in different locations according to the nature of their services, both within as well as outside of the administrative boundaries

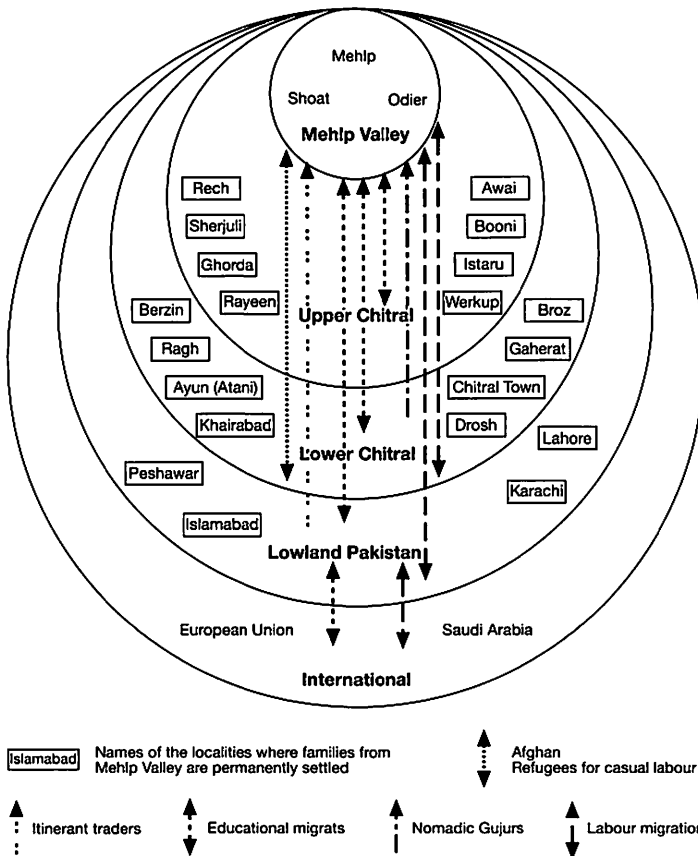


Fig. 5.4 Pattern of Population Movement from Mehlp Valley

of the district.<sup>210</sup> As is true throughout the Northern Areas, in Chitral the major employers in the public sector are the military and the education department (GRÖTZBACH 1984: 231, 1988: 32; KREUTZMANN 1993b: 30; HASERODT 1996: 12; DITTRICH 1997 and STÖBER 2001: 184f.). The situation in this village, however, differs because of its peripheral location and other controlling factors (cf. Chap. 2.1.1) (see below). In the course of time, employees in the education department are transferred back to their villages and are then no longer migrants. But this is a temporary posting, and another transfer to a far-off locality then changes their status from resident to migrant, once again.

These migrants who work either for the military or the education department regularly visit their families during the summer season and help their family members with the farming activities, as well as earning cash income. The persons employed by the military are often on leave for three months, from June until the end of September, and the educators usually have at least one month free. The salaries of the employed migrants vary from Rs. 3,000 to over 10,000, depending on their academic qualifications and position in the respective services. Employment in the public sector is highly esteemed for many reasons, mainly because of job security and the old-age pension. The number of such employees in this village has increased in the recent past. In the year 2001 they constituted 14.7 percent of the total male labour force of the village.

Currently, this village has more actively employed servicemen than retired, pensioned ones, but compared to the growth in local population, these figures are decreasing, and there are clear indications for further decline in the near future. The declining numbers of active military are due largely to the up grading of the education level (qualification) necessary for initial recruitment in the Chitral Scouts, Pakistan army and police force. For example, today the basic requirement for initial employment in the military is ten years of education (Secondary School Certificate). Because the young people of this village can only get eight school years in the valley (cf. Chap. 5.5.2.3), they are not eligible for recruitment in any of the various military services. Even when somebody is academically qualified for the above jobs, there are other problems. There are always fewer vacancies than job seekers, and members of influential families have an advantage, due to the practice of nepotism and favouritism.<sup>211</sup>

Aside from the public-sector employees, there are other employed out-migrants who earn a regular monthly salary. They are employed in five-star hotels and other private enterprises in the main cities of the lowland. Relatively speaking, they live in better residences, earn a good amount of money and visit their families once or twice a year. Some of them, however, have temporarily settled in the cities with their families. These latter usually keep in contact with their relatives in the village and visit them once eve-

<sup>210</sup> Two men from this village who became soldiers in the Pakistan army were among the United Nations' peacekeeping forces deployed in Somalia in the early 1990s. One local soldier also went to the Kingdom of Saudi Arabia in connection with training military there during the late 1980s.

<sup>211</sup> Such practices are common in the whole country. Even the non-governmental organisations are notorious for such favouritism. In Chitral AKRSP is popularly known as the 'Aga Khan **Royal** Support Programme' instead of 'Aga Khan Rural Support Programme', because of its stronghold of members of former royal families and other influential clans.



ry two or three years. Such migrants rarely send remittances back home, but they do provide potential residences for young family members seeking higher education (cf. Chap. 5.5.2.3).

### 5.5.2.2 Seasonal Wage-Labour Migrants (*Muzduri*)

These migrants are generally peasants, mostly engaged in mixed-mountain agriculture. They earn cash income during the winter season through seasonal migration to the main urban centres in the lowlands. This is one of the well-established ways of concurrently earning ancillary cash and still participating in the tradition subsistence system in the village. Through this seasonal migration, the villagers have now successfully integrated an additional 'resource niche' into their traditional production sphere (cf. SKELDON 1985: 238). As already mentioned, this practice of seasonal migration started in Odier after the creation of Pakistan, although the number of participants drastically increased after the 1970s. The main destinations of these migrants during the off-season period were major urban centres, such as Islamabad, Peshawar and Karachi. Initially, these seasonal workers travelled mostly to Chitral centre and more or less concentrated on the provincial capital, Peshawar; later on new destinations were added. For the last three decades or so the national capital, Islamabad, has received almost 95 percent of the seasonal migrants from this village.

These migrants work for daily wages, mostly in the construction industry, for five to six months, from October till the end of March/April. Some of them stay away even longer than six months, depending on the availability of male labour force at home for carrying out agricultural activities. However, they generally prefer to visit their families in summer to escape the extreme temperatures and humidity of the plains during the monsoon season. Thus this seasonal migration mostly takes place in the winter season, when there is little or no agricultural work to do in the village. By this type of out-migration they are not only earning money, but also avoiding the extremely cold weather in this village and saving the family their share of food at home. There is another interesting side effect of this type of out-migration. In the absence of the male heads of household, the women have been forced to take up all the domestic responsibilities. Compared to the men, they have proved to be more cautious in consuming firewood and fodder stocks – and the out-migrants regard this as another advantage. The seasonal migration further increases the opportunities for long-distance international migration (cf. Chap. 5.5.2.3).

Nowadays this seasonal migration has become the common routine for young men and boys. They generally try to finish their farming activities as quickly as possible, in order to join the wage-labour force at an early time. Thus the number of males aged between 15 and 45 residing in the village during the winter season is decreasing drastically. On the average, at least one member of each household participates in this seasonal migration, locally called (*muzduri*).

At their workplaces, the village men stay together in manageable groups and reside in tents and buildings under construction, in order to keep their living costs as low as possible. On the average, they earn between Rs. 100 to 200 per working day. Their total savings are not sufficient to fulfil all the domestic monetary requirements of the

whole year, as casual-labour wages are not adjusted according to inflation rates and food prices. Therefore, their families are dependent on the purchase of foodstuffs and other daily-use goods on credit from the local shopkeepers in the village. Usually they also borrow some cash from the shopkeepers for other needs.<sup>212</sup> The number of seasonal migrants is increasing year by year, because of the increasing cost of living and population growth. In the winter of 2000 and 2001, about 35 percent of the total male labour force of the village participated in *muzduri*.<sup>213</sup> Unfortunately, no comparative data is available; however, according to the rural-settlement survey (GONWFP 1988: 47), only 123 persons from the whole Mehlp Valley were reported as working outside the villages or as seasonal migrants. However, this seems to be underestimation of the real situation and far from reality.

Although the local shopkeepers and other moneylenders collect no interest on their loans, the indebtedness of the households in the village is increasing, despite their persistent efforts to sustain a hand-to-mouth living. This is due to the fact that the daily-use items are steadily becoming more expensive (cf. Chap. 5.2.4) and the number of dependants per family at the household level is constantly increasing. The debt situation is further aggravated by inadequate and relatively expensive means of transportation (cf. HASERODT 1989: 148). Most of the borrowed money is used to purchase wheat grain from the subsidised civil supply, black tea and cooking oil, emergency health care, dependants' education etc. (cf. MIAN 1986: 141ff.).

### 5.5.2.3 Increasing Numbers and New Trends in International Migration

Compared to other localities in the Hindu Kush and Karakorum region (cf. HASERODT 1989; KREUTZMANN 1993b, 1995b and AZHAR-HEWITT 1999), for the last two decades international migration from this remote valley has been persistently increasing and becoming a main source of cash income. More and more young men are participating in abroad migration. From 1988 (GONWFP 1988: 47) to 2001 the number of international migrants from Mehlp Valley more than doubled, increasing from 33 to 71 persons. Although it sometimes takes a long time to obtain such a position (see below), the application process is very well organised and the majority of migrants are satisfied with their working conditions and salaries. Detailed information on international migration is lacking, unavailable even at the district level for comparison. However, according to GONWFP (1988) the total numbers of international migrants from Chitral district were 762.<sup>214</sup> Based on these figures, out of 16 union councils in the district, Torkhow union council was at the top, with the highest number of international migrants (186 persons), followed by Arshreit union council in Drosh tahsil, southern

<sup>212</sup> At present, the services of the *Gujur* and the electricity for lighting are the main facilities that need monthly cash payment in this village. Medicine and medical treatment are other necessities that require urgent cash.

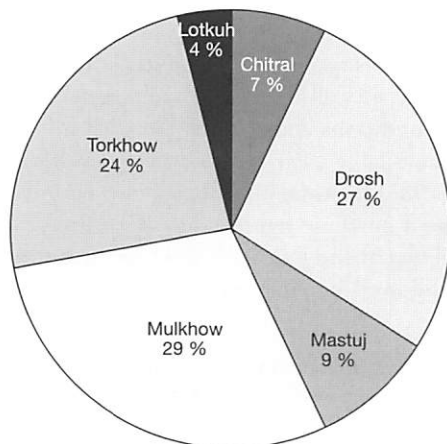
<sup>213</sup> Households unable to participate in the seasonal wage-labour migration (*muzduri*) are those either run by widows or older people, or else with no suitable male members. These same households are also unable to send members out as international migrants, an option that is generally open to all, since no particular qualification is necessary, except money.

<sup>214</sup> According to the 1981 population census (GoP 1983: 40), however, the total number of international migrants from Chitral district between 1972 and 1981 was 1,757 persons.

Chitral, with 160 persons. At the tahsil level, Torkhow is in third place, after Mulkhow and Drosh tahsils (Fig. 5.5).<sup>215</sup>

Generally, once the seasonal migrants have found work in the major cities – and especially in Islamabad – some of them manage to get jobs in the Gulf States. They always follow a legal route and don't take any risks. The negotiations are entirely arranged through various over-seas employment agents, with financial help from their relatives. The applicant has to submit documents and deposit a certain amount of money (Rs. 100,000, ca. 1,430 €) with an overseas employment agent in order to start the process. As most of these migrants are either uneducated or under-educated, the respective over-seas employment agents frequently exploit them. The agents quite often use all possible means to overcharge the migrants; sometimes the overseas agents simply take the money and disappear from the scene. Under normal circumstances the whole process usually takes more than a year. During this period, the concerned person does not do any regular work; rather, he visits the agent's office and desperately waits for his turn to come.

Before leaving for abroad the individual must, through his agent, formally sign a contract with the respective construction company, located in the Gulf States, for a minimum period of two consecutive years. Under the terms of the contract the company provides the employee with free medical facilities, insurance, residence and food. The amount of salary is also mentioned in the contract, and in most cases is paid accordingly. However, there is at this point no possibility for further negotiations in the process. The migrants have to accept all the terms and conditions of the company through the concerned agent. Moreover, all the information regarding salary and other benefits is made available to the migrant only one or two days before his departure. In most cases, the migrants face no severe problems with regard to their work and



Source: GONWFP 1988

**Fig. 5.5 Chitral District: Tahsil-wise Labour Force Working Abroad**

<sup>215</sup> The figures for international migrants from Chitral town (urban area) are not included in the Chitral tahsil data.

other facilities at their destinations. In a few cases, however, the terms and conditions mentioned in the contract are not fully followed by the concerned companies. In such circumstances, the migrants do not show any resistance and silently accept the newly imposed conditions, keeping in mind the situation they were facing in their homeland and the need to repay the debt accrued for this purpose. Moreover, communication with the officials in this regard is always a major problem: even a literate person can neither understand nor speak Arabic fluently.

In normal circumstances, after successfully completing the initial two years the migrant can formally request an extension of his contract for another two-year period. At this time the individual concerned is also eligible for a paid holiday of between six and eight weeks, and the company foots the travel expenses. To make sure the worker returns, the company officials always withhold some portion of the money, usually one month's salary, which is then paid the worker accordingly after he rejoins his work. Most of the international migrants from Odier continue this process of extensions up to decades, visiting their families once every two years for about two months.<sup>216</sup> However, the general rules regarding salary and holidays are not fixed, but vary from case to case.

The usual monthly salary of these workers is about Rs. 10,000 (ca. 140 €) per month. With this salary, they can repay their outstanding debt, accrued for this purpose, in almost one year. In addition, they have to send regular remittances back home, through banks and fellow workers, to their households and other dependants. Compared to other parts of the Northern Areas, where the contribution of foreign remittances is reported to be negligible (cf. DITTRICH 1998: 301), these international remittances make up the lion's share of money coming into this village from outside sources. Most of this money from international sources is invested in purchasing arable land in Odier, as well as in lower parts of the district. Some households invest in transport and business sectors, house construction and sending others of their relatives abroad. However, compared to the Pathans, the Mehlpl villagers lack the ability to become successful businessmen, and the former still conduct most of the business in the Chitral bazaar (cf. HASERODT 1989; DITTMANN, FAZLUR-RAHMAN & HOLDSCHLAG 2000 and DITTMANN & NÜSSER 2002). Still, the migrants spend most of their share of the money to purchase gifts and other luxury items for their immediate family members and other relatives.

During the 1990s the number of international migrants to the Gulf States increased substantially. In 2001 about 12.6 percent of the total male labour force was working abroad. This is now becoming more or less routine and appears to be instigating a chain reaction of further and repeated international migrations. The economic conditions in the country are also favouring this, to a large extent. Few development activities are being undertaken. Thus the young people of this village are trying to migrate abroad, and the village itself provides the financing. In contrast to the general practice in Punial tahsil, where the local moneylenders (shopkeepers) are avoided because of high mark-up rates (cf. PILARDEAUX 1998: 410), money lending in Odier is always without interest. Since the interested persons can readily obtain financial help from their relatives and fellow villagers, there are no real constraints to migrating abroad.

<sup>216</sup> The situation reported from Hunza Valley is quite different. There the international migrants spent only a relatively short time in the Gulf States (KREUTZMANN 1995b: 108).

This international migration is not only a major source of off-farm income, but also brings a variety of changes to the socio-economic structure of the study area. It also acts as a principal stimulant for permanent out-migration to the administrative centres and big cities, where the chances of conducting business are better than in the remote villages. Most of the men who have returned from the Middle East have invested their money in the transportation sector and purchased jeeps. Compared to others, they are more successful and are earning good profit, since their fares are always paid in cash. They are also transporting most of the subsidised grain to the village sale-points (cf. Chap. 5.2.4). Only two persons from Odier have established businesses in Chitral town after returning from the Middle East.

Thus all the households of this village are dependent on off-farm sources of income to bridge the gap between local food production and other basic needs and requirements of their growing families. Although some of the remittance money is being invested in the local production and reproduction cycle as well, without this additional income it seems that the villagers' subsistence would be very difficult, if not impossible. As a result of increasing overseas migration, a typical form of remittance economy has been established in this village and the traditional systems of socio-economic organisations and other bilateral relationships are changing rapidly. Although there is neither a post office nor a bank in Mehlp Valley, the entire money transaction system is apparently similar to the so-called 'money order' or 'remittance economy' (cf. NEGI 1981; IVES & MESSERLI 1989: 223; SANWAL 1989: 6 and GRÖTZBACH & STADEL 1997: 33).

#### **5.5.2.4 Educational Migration and New Trends in Informal Education**

Educational migrants usually have a variety of destinations and durations of stay, depending on the type and level of education, and what their parents/guardians can afford. At present, there is one middle school for boys in this valley, providing up to eight years of education. After successfully completing this schooling, students interested in further education have to leave the valley. Generally, such students stay with distant relatives or immediate family members either within or outside of Chitral district, as there are no student hostels, and most of the parents/guardians are unable to afford further expenses. Sometimes these students also change their residences, according to their education level and location of the educational institutions. Up to the bachelor level, the main destinations are the administrative centres within the district (cf. KOMOLL & KAMP 1998), and a very few of the bachelor's candidates also leave for other major cities in the lowlands. At present, a few female students are also included in this category. They are staying with their relatives, and occasionally close family members, and attending schools for about two years in order to complete their ten-year schooling. Nevertheless, not a single female student either from this village or from Mehlp Valley is currently registered at any higher educational institution above the secondary-school level. The overall duration of outside studies varies from six years within the district (up to B.A.), to a maximum of eight years (up to Masters) for the formal education.

Aside from the formal education, some students are also attending informal education institutions, i.e. the religious schools (*dini madrasa*).<sup>217</sup> The main *deni madrasa* are located in the major cities of Pakistan, especially in Peshawar, Karachi, Lahore and Islamabad. Students attending these schools are commonly known as *talib alum* or *talib* (“seeker of knowledge”). They remain in the educational institutions for more than seven years. For the last one or two decades, the number of students from the village attending religious schools (*dini madrasa*) has been constantly increasing.<sup>218</sup> In general in the Northern Areas of Pakistan, the historical and current trends of religious education involve international migration. This is especially true in Baltistan, where the number of foreign migrations is continuously growing (cf. RIECK 1997). No similarity to this trend has been found in the study area, however.<sup>219</sup>

There are various reasons underlying the new trend towards religious training. For one, a formal school education is more costly and is beyond the means of many poor families. Then, even after successfully completing a formal education, employment opportunities are very rare, especially for members of the poor households. In contrast to this, religious education is still very cheap, with free food, books and residential facilities. The young students can also reside in the neighbourhood mosques of the city, close to the *madrasa*, and serve as assistants to the priest. Doing so, they get free food, shelter and even earn some money from the mosque-management committees that are functioning in each neighbourhood. There are no particular job opportunities for students of the religious schools after the successful completion of their studies, but they gain more respect and power in the society as learned, religious personalities (cf. Chap. 4.6.3.2).<sup>220</sup>

For example, the main priest of the village (*qazi*), who offers and leads the Friday congregation at the central mosque of the village, enjoys a distinctive and distinguished position in the community. Although he is not paid for his services, he is exempted from most of the communal responsibilities of the village, i.e. channel and road maintenance, turn grazing of goats, and mosque management. The entire village community, however, stands ready to carry out his agricultural work at his formal request, on a priority

<sup>217</sup> Small institutions with a relatively low number of students and limited numbers of teachers are usually called *madrasa*; and large institutions with more than 500 students and other facilities are known as *Dar-ul-alum* (“centre of knowledge”). The former small institutions are located in small villages, and co-education is usually practised; the latter are located in the big cities, and are predominantly for male students. There are very few *Dar-ul-alum* for females as well. The *Dar-ul alums* are mostly financed by religious trusts and local communities. A very few of them are organised and financed through the Ministry of Religious Affairs and Endowment.

<sup>218</sup> Until 1990 there was only a single person in Odier with a certificate from a religious school and nobody who had learned the whole Quran by heart (*hafiz*). At present there are four people with certificates and 14 persons who have learned the Quran, not counting the new students.

<sup>219</sup> Relatively very few people from the former Chitral State travelled to India before partition for seeking religious education there. The first state-sponsored *deni madrasa* was established in the present Chitral Town after the creation of Pakistan, in 1952.

<sup>220</sup> For similar trends in the Northern Areas of Pakistan, see RIECK (1997) and AZHAR-HEWITT (1998).

basis, as a mark of respect for his services to the community. He performs some of the light agricultural work by himself, but the community perceives hard work, such as carrying loads and cutting *moshin* etc. as detrimental to his honour and position as village priest. He is expected to be the main arbitrator in the village-level conflict resolution system, and most of the time cases reported in the local courts are also referred back to him for consultation. It is his task to help the conflicting parties reach a compromise according to the customary and Islamic laws. Likewise, up until recently the tahsil *qazi* used to be a permanent member of the *jirga*. The neighbourhood priests (*pesh imam*) who lead the daily prayers in the neighbourhood mosques are also respected, but they are not exempted from any communal responsibilities.

Consequently, the young people from Odier and other areas usually prefer to enrol in these free religious schools, rather than joining the daily-wage-labour force (*muzduri*) (cf. Chap. 5.5.2.2).<sup>221</sup> Students who attend these higher-level institutions of informal education are predominantly male, although there are a few institutions for females, as well.

In terms of economics, most of the educational migrants are unproductive and, with a few exceptions, most of them receive financial support from their parents and guardians. After the successful completion of their studies, some of them find jobs in the major cities and became long-term migrants. Even in such cases they mostly keep in touch with their families in the village and send regular remittances back home. They visit the village twice or thrice a year, and also participate in the seasonal agricultural activities.

## 5.6 Non-Governmental Organisations and Response from the Community

During the late 1980s, two non-governmental organisations (NGOs) initiated development works in Chitral district. The Aga Khan Rural Support Programme was the first NGO to come to this district, after being established in the Northern Areas of Pakistan in the early 1980s. This programme was initiated with financial help from the Aga Khan Development Network (AKDN).<sup>222</sup> Later on, many organisations from the developed countries, such as Gesellschaft für Technische Zusammenarbeit (GTZ), Canadian International Development Agency (CIDA), Over Seas Development Agency

<sup>221</sup> In addition to the above listed benefits, there are no strict formalities involved in enrolling in these institutions. Anybody, without age restriction or ability to read and write, may simply enrol in any institution. In contrast to this, entering a formal education is relatively complex, with age restrictions and other formalities of uniforms etc.

<sup>222</sup> Before the launching of AKRSP, other AKDN projects, such as Aga Khan Health and Education Services, were already in operation in the *Ismaili*-dominated villages of the Northern Areas and Chitral. AKRSP then became the only AKDN programme operating in the *Sunni*- and *Shia*-dominated areas of Astor, Chitral and Baltistan, and no restrictions were applied for non-*Ismaili* communities, as in case of Health and Education. The entire population of the Northern Areas and Chitral, irrespective of individual affiliations to the different religious sects is still today eligible to receive benefits from these services. For more details on AKRSP, see STREEFLAND, KHAN & LIESHOUT (1995); WORLD BANK (1995) and CLEMENS (2000).

(ODA) etc. started financing the rural-uplift projects of this NGO. The government of Pakistan also contributes some money to the yearly budget of AKRSP. This NGO initiated its work with a new development strategy that ensured the participation of local villagers in the whole planning process, from project identification and approval to implementation and monitoring. Moreover, after successful completion of a project, the maintenance/management responsibilities were also entrusted to the concerned village communities or members of village organisations (cf. Chap. 5.7.1 & 5.7.2).

Village and women's organisations are the principal grass-root or village-level institutions through which AKRSP promotes its development objectives. The general characteristic and related responsibilities of a village organisation (VO) or women's organisation (WO) have been prescribed as:

*"The VO is a mass coalition of all those residents of a village whose continuing economic interests are best served by organizing as an interest group. Such an organisation can be created around an activity of averring importance to most of the villagers. The VO is meant to be a self-sustaining development institution at the primary village level that can enter into partnership for development with outside agencies. It meets as a general body on a regular basis so that all members can review the needs and performance of their organisation. As a necessary condition, all members must make saving deposits at their regular meetings. Savings generated by individual members are the liability of the VO. The generation of capital through savings is of paramount importance to the viability of the VO, and it is used primarily as a collateral for loans to finance subsequent development projects in the village."* (KHAN & HUNZAI 2000: 136, Tab. 9.1, emphasis added)

The general procedure for getting development projects and other benefits from AKRSP is to establish a VO with maximum participation of the village households (at least 70 percent) according to WORLD BANK (1995: 31), and to select two persons to carry out the official work. It is compulsory for every member to contribute an initial fixed amount of money as savings to be deposited in an account held jointly by the village organisation and AKRSP. The VO is obligated to hold regular monthly meetings to keep the members in touch and informed, and the minutes of these meetings are recorded. All VO members are also supposed to continue the process of donating savings at every meeting. This money collected from the individual members of the VO is entered in their passbooks and then collectively deposited in the above-mentioned joint bank account. The village organisation is then eligible to get credit from AKRSP, using the deposited money in the bank as collateral. A request for any 'productive physical infrastructure' (PPI) – a term used by AKRSP for small development projects, such as a link road, irrigation channel etc. – is made through a resolution agreed upon by the majority of members of a VO. Initially AKRSP emphasised the provision and improvement of small-scale infrastructures at a village level, such as link roads, the construction and improvement of an irrigation channel etc. With the passage of time, however, new issues such as natural resource management, afforestation programmes and capacity building (see below) have also been included as development packages for VOs and WOs.



The WO situation is quite different from that of the VOs. There are regional disparities both in the number of WOs, as well as in the women's participation in the development-related activities initiated by the AKRSP in the whole programme area, from Baltistan in the east to Chitral in the west. The main objective of establishing WOs is to ensure the access of females to resources/products that they produce or process, and to empower them to utilise the profits of their own hard work. The achievement of these targets means largely redefining the conventional role of women, and is quite problematic throughout the whole region, due to the prevailing local customs, traditions and socio-cultural values. The inhabitants of the *Sunni*- and *Shia*-dominated villages in the programme area are relatively conservative and have not yet accepted the formation of WOs in their respective villages. Additionally, the majority of women in the AKRSP programme area are in any case unable to pay the initial amount of savings (ca. Rs. 300) to get membership in a WO. Because of these factors, WOs are predominantly restricted to the *Ismaili*-dominated areas, and mostly only the wealthy and well-off women become members of these WOs. According to IVES (1997: 80),

*"Poor 'peasant' women are omitted, or marginalised, because they cannot afford the nominal cash savings that are obligatory for membership, or their heavy workload in securing the family subsistence leaves them no time to work on AKRSP projects".*

In the early 1990s, the Chitral Area Development Programme (CADP) was also introduced in the district. Unlike AKRSP this programme was exclusively financed by the International Fund for Agricultural Development (IFAD). CADP followed the same general principles as AKRSP and established some new village organisations in Mehlp Valley for the provision of basic facilities and infrastructures. The overall progress and success of these non-governmental organisations were quite satisfactory; however, response from villagers in different parts of the district to the NGOs was diverse. AKRSP was introduced shortly after the 1982 clashes between the *Ismailis* and *Sunnis* in Chitral town (HASERODT 1989: 100 and DITTMANN, FAZLUR-RAHMAN & HOLDSCHLAG 2000: 267). As a result, AKRSP was welcomed in the *Ismaili*-dominated areas and accepted as an extension of the other AKDN projects (e.g., the Education and Health Administrations) which were already functioning in their areas before this programme began (cf. STREEFLAND, KHAN & LIESHOUT 1995: 69 and STÖBER 2001: 234f.). In contrast to this, strong opposition and resentment came from the *Sunni*-dominated valleys of Chitral district. In August 1999, following the murder of a religious leader, all the activities of AKRSP in Chitral town were completely stopped for more than two months. Since then the main office of AKRSP in Chitral town has been guarded by a contingent of Chitral Scouts.

In the case of Odier village, however, the VOs were short-lived; they were not sustainable in the form foreseen and prescribed by AKRSP. The activity of the VOs ended with the completion of the PPIs listed below, and in some cases the development works were even left incomplete.

### **5.6.1 Village Organisations and Projects Completed**

Mehlp Valley as a whole, as well as all the individual villages, has benefited from the non-governmental organisations (NGOs). Many village organisations (VOs) were

established to obtain funding for different projects and about 95 percent of the households were represented in these VOs, one way or another. In some cases members of one household were distributed among different VOs to complete the threshold membership for a new VO. The majority of the VO members neither attended the monthly meetings nor contributed the regular savings. Therefore, these VOs remained active only for a short time, and never became effective enough to replace the old traditional organisations of the respective villages. Moreover, not a single VO was established in Odier village.

In Odier a total of six projects were completed from 1986 to 2000. All except one were financed by AKRSP. The nature of these development projects was different here than elsewhere. As a general trend, more than half of the projects in the whole programme area were concerned with irrigation infrastructure (cf. WORLD BANK 1995: 20; KHAN & HUNZAI 2000: 138; KREUTZMANN 2000f: 498 and PARKES 2001: 3).<sup>223</sup> In this village, however, more emphasis was placed on the construction of link roads. The first financial assistance from AKRSP was granted for the improvement of an irrigation channel in the lower part of the village. The project was successfully completed and the amount of water in the channel more than doubled. This was followed by a 'cluster project' for widening and improving a 12-km jeepable road connecting Mehlp Valley with the main Chitral Torkhow road.<sup>224</sup> This road had been partially constructed by the villagers on a self-help basis. Most of the villagers of Mehlp Valley participated in this road maintenance work. In 1992 two village organisations simultaneously initiated a link road and a jeepable bridge over Mehlp stream, to connect Odier with the main Mehlp Valley road. The jeepable link road failed badly, due to physical hazards and disagreement among the VO members on its further extension within the village limits. The jeepable bridge project was partially successful.

Another project was launched to construct a new irrigation channel and ameliorate a former pasture area of about 100 acres. This development was carried out through another VO. An approximately two-km-long irrigation channel was constructed coming out from the perennial river, and the whole area under the command of this channel was divided into small parcels. All the VO members got one or two small land parcels of less than two acres. Although some of the VO members were not co-owners of this common property (cf. Chap. 3.4.4.1), they also received equal shares in accordance with the general AKRSP guidelines. Most of the area (95 percent) has now been developed by the owners and given to fodder crops (lucerne) and tree plantations (cf. Map 3.3

<sup>223</sup> According to Chitral Conservation Strategy (cf. [www.ccc.iucnp.org-irrigation.pdf](http://www.ccc.iucnp.org-irrigation.pdf), nd:13) "After 1983 two projects, the AKRSP and CADP, have invested more than Rs. 139.30 million in the irrigation sector."

<sup>224</sup> Normally there are two types of projects: one is for a single village organisation or village, and the second is for more than one village or village organisations. The latter is called a 'cluster project' and is shared by all the participating villages and village organisations. Cluster projects are bigger than the normal VO projects, both in respect to cost and resulting benefits, as was the case with the main road of Mehlp Valley. In many cases there are multiple village organisations in a single village. For big projects, the households of a single village sometimes establish many village organisations, to make a valid case for getting a larger amount of money.

& Map 3.4). As a result, the number of beneficiary households increased and, with the change in the ownership and division of the pasture into small fragments, the former owners lost their main haymaking area and spring-/winter-season pasture. Currently the participating individuals are restricted to their own parcels, which are quite small. Again, with this change in ownership and development of the area, the possibility of controlled sheep and goat grazing within the territorial limits of that pasture was at an end. The fodder collected from this area is not sufficient to compensate for the pasturage use for about six months of a year.

The last project in this village was initiated in 1999 to construct a micro-hydroelectricity plant. A site was selected close to the water mills, and the water-mill channel was widened and improved throughout its length. In particular, the headworks were newly aligned to ensure a sufficient amount of water for generating electricity during the winter season. Despite strong opposition from some households (cf. Chap. 5.8), all the former village organisations participated in this project and it was successfully completed within one-year period. Since then it is functioning smoothly under local management (cf. Chap. 5.7.2).

In addition to these development projects, four persons from this village were also trained in agricultural, forestry and livestock sectors by AKRSP, as part of its human-resource development and capacity-building programme. Another man was specially trained to manage and handle the micro-hydel. In addition to imparting practical knowledge through intensive training, AKRSP also gave all five trainees the necessary equipment, medicine etc. to help the village VO members in their respective fields as 'village organisation specialists'. Through their full-time presence and availability, they were supposed to function as innovators in the village; however, for a variety of reasons this did not work out as foreseen by the AKRSP officials. Even the micro-hydel specialist, who was receiving a regular monthly salary for his work (cf. Chap. 5.7.2), left his job after a short while.

### **5.6.2 Current Situation and Future of AKRSP-Initiated Development Activities**

The AKRSP's partnership model had considerable success in the whole programme area, from Baltistan to Chitral, with the local inhabitants participating in rural development and long-term maintenance of the newly established physical infrastructures. Nevertheless, opposition persisted from some sections of the population, especially in the *Sunni*-dominated areas of southern Chitral. Mehlp Valley also went through the same process of resistance by few households but, despite strong opposition, some of the development works were successfully completed, whereas many villages of the district, especially in the south, remained practically outside the sphere of this NGO.

In Odier, the last project (the micro-hydel plant) caused a lot of opposition and the villagers split into two groups. This resulted in the temporary suspension of a few traditional reciprocities and co-operative activities between the opposing groups. The community tried its best to bring its affairs back to normal, but failed to do so; consequently the matter went to the local police. Although the opposition households were in the minority, the village community was unable to afford such a split for long time

because of the close family relations and other socio-economic interdependencies. As a result, after one year of severe tension, a compromise was made between the conflicting parties, and it was agreed upon not to accept any further help (financial and technical) from the AKRSP. The old grievances are still felt today, and most of the opposition members have not yet got electric connections from the micro-hydel.

As a result of this split in the village community, all activities of AKRSP have practically ceased in this village, and the already weak village organisations are no longer in operation. Although, a number of new organisations were established to maintain and operate the newly constructed infrastructures (cf. Chap. 5.7), the new systems were never integrated into the old traditional village organisations. Thus, in spite of its general success in other parts of the programme areas (cf. BUZDAR 1988: 16; KREUTZMANN 1989, 1993a; HUSAIN 1992; WORLD BANK 1995; PILARDEAUX 1998: 380f.; CLEMENS 2000; KHAN & HUNZAI 2000; and ZIA 2000: 231f.), the participatory rural-uplift programme initiated by AKRSP in this village in 1986 came to an end without achieving the foreseen and anticipated results of rural development.

## **5.7 Maintenance of Newly Constructed Infrastructures**

The operation and maintenance of the newly developed irrigation projects were very simple, as irrigation channels were already integrated in the traditional communal repair and maintenance system that was in practice for generations in the village (cf. Chap. 3.4.4.2). For other infrastructures, however, there was a need to establish new organisations for carrying out the operation and maintenance activities on a long-term basis. In contrast to irrigation channels, which were of utmost importance to everyone, other infrastructures were not directly beneficial for all households in the village, and hence conflicts of interest became unavoidable. For example, roads were important only for the village shopkeepers and drivers with their own jeeps; the common man cared less about keeping them repaired. Moreover, since the villagers were already paying the drivers in cash for their carriage and travel, the common households perceived road maintenance purely as an extra burden on their shoulders, good for nothing. However, the perception of the villagers changed in 1992, as soon as a new sale-point was established in the village. Up to that time the villagers had been half-heartedly maintaining the jeepable road once or twice a year, under pressure from the village elders. Nevertheless, after the availability of subsidised wheat in the village, it became very easy to organise and mobilise communal labour for road maintenance. As almost all the households of this village are dependent on subsidised grain to compensate their food deficiencies (cf. Chap. 5.2.4), the villagers' participation in road maintenance was established as the single pre-requisite for purchasing subsidised grain from the village sale-point. Thus all the households became stakeholders in the link road connecting this village with the Mehlp Valley road.

### **5.7.1 Maintenance of Jeepable Roads**

The Odier villagers had initially constructed a 12-km road, starting 300 meters below the village and reaching to Rayeen, on a self-help basis. The main problem was to extend it up to the built-up area of the village. The lower part of Odier is located 200 to 300 meters above the stream course. The gradient is very steep, and from all sides the area

is prone to both landslides and winter-season ice spreading from the small perennial springs. In 1985 the villagers made an attempt, and constructed a two-km-long looping road, linking the lower part of the village to motorised traffic. In 1987 this road was successfully extended to the upper part of the village, as well. But since the lower part of this newly constructed link road passed through a north-facing ridge, it was prone to ice and snow hazard. Some areas of it were also prone to landslides and mass movement. Thus it was difficult to keep the road open for four-wheel traffic for most parts of a year. In addition, some households complained that the constant maintenance of this road was further intensifying the landslide process and increasing the damage to their limited and valuable arable land. Moreover, since there was no permanent bridge over the stream, it was not possible for jeeps to cross it during the peak discharge season, from mid May till the end of July.<sup>225</sup> Thus the village remained only partially connected with motorised traffic, despite the villagers' persistent efforts.

In 1990 a jeepable bridge was constructed over the stream in the northeastern corner of this village, although it was not connected with any link road (cf. Chap. 5.6.1). In 1993 a new (second) link road was built, running over this already existing, freestanding bridge and extending to the upper part of the village. The majority of the villagers (95 households) – all except the Somalay clan in lower part of the village – worked on this construction on a self-help basis.<sup>226</sup> On this occasion, there was a considerable misunderstanding among the villagers. In a highly competitive atmosphere, the Somalay clan (comprising the remaining 27 households of the village) initiated their own maintenance work on the old 2-km looping link road and constructed a second jeepable bridge over the stream, also on a self-help basis. After these two bridges were successfully completed, for some time the two groups of villagers maintained their quarrel, with each side using only their own respective road. However, with the passage of time new events distracted the villagers and the old grudges were forgotten. The most important cause of the villagers' reuniting was the micro-hydroelectricity project – although that, in turn, created new schisms (cf. Chap. 5.7.2).

<sup>225</sup> This period always coincides with the seasonal change of pasture for controlled turn grazing in late spring (cf. Chap. 4.3.2.2). Therefore, before 1993, when the Somalay clan constructed their permanent jeepable bridge over the stream in the northwestern corner of the village, there was a special arrangement for constructing a temporary bridge every year. The households residing in the lower part of the village (mainly goat owners) took turns for constructing a small bridge over the stream, mainly for sheep, goats and general access. This was carried out on yearly-turn basis: one year the neighbourhood of Somalan deh was responsible, and the following year the Bulan deh neighbourhood worked on the construction. This bridge was short comprising only two logs about six to seven meters in length. For convenience, flat stones were placed over these logs. The whole work usually took half a day, and the logs were removed on the last evening before the villagers' collective shift to the summer settlements (cf. Chap. 4.5.1). For one decade, since the construction of a jeepable bridge, this problem has been solved on a permanent basis.

<sup>226</sup> The Chitral District Council also provided some financial assistance for this link road, but most of that money (70 percent) was given to the affected households of Shoat village as compensation for their land. That is why the respective households performed more than 90 percent of the work on a self-help basis.

In any case, the groups have made up their differences, and both are successfully maintaining and repairing their own roads as independent groups. As a result, at present there is no problem of access to this village from the Mehlp Valley road most of the year.

Both of these link roads suffer hazards in winter. Due to extremely low temperatures, ice spreads over the roads from the perennial springs, and heavy snowfall is another problem. Therefore, these link roads remain closed for vehicular traffic from December until the end of April. Nevertheless, the main access road to Mehlp Valley, which leads through an area with southern exposure, remains open for four-wheeled traffic throughout the year. This road from Chitral centre to Rayeen village is also subject to generally bad road conditions. There are three seasonal road-workers from the district council responsible for performing daily repairs on the Mehlp Valley road. In the case of heavy damage following a torrential rain or snowfall, however, the residents of Mehlp Valley collectively carry out the emergency repairs. Depending on the nature of the damage, it usually takes two or three days for the road to be reopened for vehicular traffic.

The maintenance of the link road newly constructed by 95 households of the village was properly organised through the traditional model of sharing collective responsibility. This link road was put under a joint maintenance system for about one year. Decisions on what repair work was required were jointly made after the Friday congregation in the central mosque of the village, and the repair work was carried out as needed. After one year, some loopholes in the traditional maintenance model became evident to the community. The concerned households realised that, because the responsibility of road maintenance was so widely distributed among the members, the accountability mechanism was a bit weak. At that point a second model was applied to avoid the loopholes of the first one.

The idea was to both decentralise the maintenance system and make the spectrum of responsibility and accountability a bit narrower within the decentralised groups. For this purpose, the whole length of this link road was divided into two parts. The responsibility for maintaining the first part of the road, comprising the length of road within the village boundaries, was given to those households who owned arable land on either side of the road. With this new arrangement, one of the main causes of road damage was automatically resolved, as the concerned households were motivated to start controlling the overflow of water that occurred while they were irrigating their adjacent fields. Moreover, after irrigating the fields they were immediately able to restore any small irrigation leats and water diversions over the roads to the proper order. The second part of the road i.e. the length outside of village limits was once again subdivided into two sections and assigned to the remaining households for maintenance. This system is still functioning quite satisfactorily, and the relevant groups are maintaining their respective road sections for most of the year. When any damage or problem occurs, the concerned group is informed and they are collectively responsible for the repair and maintenance of their section of the road. At the same time, they are accountable to the village community for their overall performance. Since 1999, the introduction of the threshing machine in the village further facilitated the implementation of road-maintenance rules: now the defaulters are not allowed to use the threshing machine.

## 5.7.2 Micro-Hydroelectricity and its Operation and Maintenance

In the year 2000, with the financial and technical assistance of AKRSP, the village also got a micro-hydroelectricity plant (cf. Chap. 5.6.1). This is a new innovation in the traditional management system, involving regular collection of bills and keeping the system functioning almost every day of the year, for six hours in the evening and two hours early in the morning. The micro-hydel needs both control mechanisms and managerial support to ensure rules implementation, operation, maintenance and account keeping. After successful completion of this project, a committee comprising nine persons representing the main clans of the village was constituted to manage and supervise the day-to-day affairs. The user households appoint the committee members for a one-year period. The committee's job is to supervise the proper functioning of the system and, at the same time, also to collect the monthly charges from the households and keep a detailed accounts book (see below). They have a regular monthly meeting to discuss the relevant issues, maintenance, purchase of oil and other necessary matters. They are also authorised to pay surprise visits on the households, to check whether they are using the approved voltage of fluorescent tube-lights. Each member has been assigned a fixed number of households of his own clan and neighbours, from whom he collects the monthly bills.

The charges fixed for the beneficiary household are not based on the consumption of electricity, but on the number of small tube-lights that the household is using for lighting. The fixed charges are Rs. 30.00 per month for up to three small-sized tube-lights of about 30 to 60 cm in length; for exceeding numbers, an additional amount of Rs. 10 is charged per tube-light per month. Due to the limited power-generation capacity of the micro-hydel, bulbs of any other than the approved voltage and any domestic appliances other than radios and cassette players are strictly prohibited. To ensure that the system functions smoothly and provides a steady supply of electricity, two operators have been hired for a fixed monthly salary. They work under the supervision of the management committee, and are paid from the money collected from the beneficiary households. The micro-hydel operators must be physically present in the small powerhouse and vigilantly control the functioning of the system. Normally the operators run the machine in the evening from one hour before sunset until 23 hours, and in the morning for about two hours early at dawn. In the fasting month (Ramadan) they follow a different schedule, and instead of early dawn, they start the machine three hours before dawn. On special occasions they may keep the machine running throughout the night, but this is only possible on prior request.<sup>227</sup>

The terms and conditions of the micro-hydel project specify how the money is to be distributed. After the operators' salaries and other recurrent expenditures are paid, the total remaining revenue of the micro-hydroelectricity plant should be deposited in the joint account of AKRSP and the village organisation as a collective savings for all the VO members (cf. Chap. 5.6). In this case, however, the money earned is barely enough to cover the operational charges and the surplus amount is negligible. As the whole plant

<sup>227</sup> Special occasions requiring more electricity occur when somebody is seriously ill, or a marriage ceremony is scheduled in the village, or maybe a household is hosting an important guest. For any of these reasons, the operators must be requested beforehand.

management – from generation, to supply and billing – is in the hands of the villagers, it is done in a very relaxed and flexible fashion, according to the prevailing local conditions. For example, every household is allowed to have electric connections for all its houses, in the upper and lower parts of the village as well as in the summer settlement; the monthly bill takes into consideration only the house in which the household actually resided in that month. If two houses were used simultaneously – which is quite rare (cf. Chap. 4.5) – then the concerned household has to pay for both houses. In this case each house is considered a single independent unit, and the minimum limit in the number of small tube-lights applies in each case.<sup>228</sup>

This regular monthly payment of bills is new for the Odier villagers. For the first time in the history of the village, beneficiary households are regularly paying in cash for a facility/service. In the absence of any permanent source of cash income in the village, many households have difficulty in raising money for the timely payment of bills. Nonetheless, under the pressure from the micro-hydel management committee, they are managing it. As a general rule, bill collection is very strict to avoid any default. All the households with electrical connections have to deposit the outstanding amount due from one month with their respective committee members on or before the 5<sup>th</sup> of the next month. If a household head fails to do this, his house will be disconnected from the electricity network and a fine of Rs. 500 will be imposed on him for restoration of the connection. Although the committee members are always complaining that there are many anomalies and delays in the payment of monthly bills, this punishment has not yet been imposed on anybody. In some cases, committee members are even paying on behalf of the households. The easiest and most commonly followed method, however, is to borrow money on credit from the shopkeepers. The shopkeepers are currently paying the management committee the outstanding amount on behalf of many households; they then write the default amount in the regular credit book (*khata*) of the respective household (cf. Chap. 5.2.4 & 5.5.2.2).

### **5.7.3 Maintenance of the Sale-point and Dealing with Concerned Officials**

The Odier sale-point was constructed in 1992 in the lower part of the village on a self-help basis. It is a single room with a storage capacity of ca. 3,000-grain bags. All the households participated in the construction and also contributed equally in the provision of timber, and the absentees from this communal work were charged accordingly. Later on, in 2001, the villagers renovated the whole structure and the old dusty floor was replaced by cement. In principle all the households of this village are collectively responsible for the safety and proper storage of the subsidised grain. However, one person (the sale-point *chokidar*) has been nominated by the villagers to deal with the

<sup>228</sup> Such an arrangement would be unimaginable, if the state-owned Water and Power Development Authority provided the electricity. In that case each household would be supplied with a single connection, with a meter affixed to it. The household must then pay a fee for the meter itself, even if they are not actually residing in that house. As the households in this village, as well as the rest of Mehlp Valley, seasonally change their residences (cf. Chap. 4.5 and App. 5), the local arrangement is optimal in that it enables them to maintain their electrical connections throughout the year.



government officials and look after the grain depot. His responsibility is to keep the records of the depot, store empty grain bags, receive grain from the drivers, sell grain to the households and deposit the money with the tahsil clerk (cf. Chap. 5.2.4). In cases of grain shortage he also contacts the high officials. At the end of the year, both the responsible contractor and the tahsil clerk visit the sale-point and officially hand over the grain stock to the sale-point *chokidar*. Both the drivers and the contractor need written proof from the sale-point *chokidar* to claim restitution of their carriage charges from the Food Department. He is moreover entrusted with making minor repairs to the storehouse and removing snow from its roof. He is paid by the villagers at a rate of Rs. 4.00 per grain bag at the time of purchase.

## 5.8 Impacts on the Functioning of the Traditional Society

All the transformation processes in the recent past have had both positive and negative impacts on the functioning of the traditional systems, the socio-economic co-operations and reciprocity arrangements in the village as it occurred elsewhere (cf. JODHA 1992). Both individual households as well as the village community as a whole have suffered and at the same time benefited from the innovations. The reorganisation of social responsibilities among the clans and restructuring of the traditional economic system on new lines have made many poor households and minor clans groups more susceptible to unpredictable events. Joint households with more able-bodied male members have temporarily benefited from long-term migration <sup>229</sup> and are in a relatively better position with respect to financial resources, arable land and livestock ownership. But as the joint families continue to break down into nuclear families, this will only be a temporary relief and also, in a real sense, serves to increase the number of potential heirs who will ultimately partition their property. To achieve long-term benefits, there is a need for proper investment and better utilisation of the available money. This is quite difficult for the villagers, as they have very limited business experience, and no other investment opportunities except for business exist. Also, with the passage of time the possibility of purchasing arable land is dwindling in the village.

Another important problem resulting from the changing socio-economic structure in the village is the readjustment and reorganisation of the labour force. The traditional organisation of time and space, which ensured optimal resource utilisation and maintained an inherent diversity in agriculture and animal husbandry, needs a relatively large labour force. Moreover, daily and seasonal rhythms of agro-pastoral work in the village – the seasonal changes in the pattern of activities and location of workplaces within the village limits – all demand a numerous threshold population (cf. Chap. 4). To cope with this pattern of seasonal movement, in the past all the responsibilities were divided among the available labour force. This was not only a traditional strategy, but also a good mechanism for passing the necessary abilities and indigenous skills on to the youths in the village through practical experience (cf. Chap. 4.6.2). But increasing school attendance and out-migration from the village, as well as the introduction of a monetary economy, have changed the whole traditional social set-up. Due to change in

<sup>229</sup> This relationship between the joint-family system and the households' ability to spare members for out-migration and off-farm activities has also been reported from other areas (cf. KRENGEL 1997: 177).

livestock ownership, the concerned social organisations at both the village and neighbourhood levels have automatically collapsed. Long-term overseas migration of the male household members has not only increased the workload of the females but also stressed some of the reciprocal labour arrangements in the village (cf. Chap. 4.6.5.3). The numbers of female household heads are increasing, especially during the winter season when almost 80 percent of the males above the age of 14 are outside the village. As in other mountainous areas of Pakistan, this has changed the traditional division of labour, and today women and elderly people are shouldering most of the responsibilities that were traditionally performed by children and young men up to the recent past (ALLAN 1989: 135f.; KREUTZMANN 1989; HUSAIN 1992 and HERBERS 1998). A few of the agricultural innovations, – e.g. threshing machines and new grazing arrangements – however, have relieved some of the burdens on women and elderly people.

Due to the persistent increase in population and heavy dependence on lowland food-stuffs, the need to earn cash is continuously increasing. However, in the study area cash income as a single source is not enough for a household to meet its needs at both ends. Some of the agricultural products (milk, meat etc.) are not available in the village at affordable prices; likewise, the salaries of the employed persons and earnings of the daily-wage labours are not sufficient to purchase all domestic necessities. Therefore, combined mountain agriculture is also carried out parallel to off-farm earnings, either as a primary or secondary contributor to the household subsistence economy. In the meantime, both agriculture and animal husbandry are also dependent on cash income. For instance, the monthly payment for the *Gujur*, use of the thresher and purchase of chemical fertiliser all require money. This new trend towards capitalism in this remote and marginal village has had a negative impact on the traditional exchange of labour, and at present the *yardoyee* system is under heavy stress (cf. MEILLASSOUX 1983).

Out-migration also plays a major role in the changing socio-economic structure in the village. It is one of the main causes of cultural change. On the positive side, it reduces population pressure (at least temporarily), contributes substantially to the domestic subsistence economy, and integrates the remote villages into the mainstream economic system of the state. On the other hand, it has highly increased the mountain inhabitants' dependence on the lowlands and, through propagating an urban way of life, has resulted in erosion of the traditional knowledge systems and locally suitable subsistence strategies. It undermines the traditional skills and locally feasible resource-management mechanisms by changing the perception of the local inhabitants. Long-term out-migration has other obviously negative impacts on the village-level co-operative and reciprocal practices.

New trends in the education sector have also brought many changes to the village from the lowlands. In some cases the introduction of new ideas stemming from the newly available education are leading to extreme conflict situations.

For example, due largely to the agitation of students, the construction of the micro-hydel caused a lot of problems in the village (cf. Chap. 5.6.1).<sup>230</sup> The whole village split into two groups, one in favour and the other against this project. The situation became extremely tense, and the traditional reciprocities at neighbourhood and village levels suffered a lot. This schism was one of the root causes that led to changes in the old burial arrangements (cf. Chap. 4.6.5.1) and the introduction of two Friday congregations in the village. At present, individual clans are assuming more and more responsibilities for burial arrangements, instead of the whole village, as it was in the past. The clan of the deceased person has been made responsible for all the arrangements, from digging the grave to providing the stone slabs to cover it, but in reality, most of the villagers continue to participate in the burials of their own free will. There is a possibility, however, that in near future all these arrangements and responsibilities might be totally delegated to the individual clans. In that case, the three clans of the village (Khushay, Nasketek and Shadeyay) who do not have the necessary threshold population to organise such burial arrangements will be at an enormous disadvantage. Moreover, with the infighting in the village, all the AKRSP VOs completely ceased to function, and with them, all possibility of getting new development projects and other technical assistance from AKRSP also vanished, once and for all.

Today the village community is still divided into two groups i.e. pro- and anti-micro-hydel, and the possibility of forging a compromise between the conflicting parties is vanishing, as the many efforts initiated by individuals and groups to bridge this gulf have ended almost entirely unproductively. Thus another result of the mistrust and rivalry between the two groups is that the traditional low-cost conflict-resolution mechanisms, considered to be the backbone of local-level collective action and common property resource management (cf. BHATIA 1997; OSTROM 1990 and PRETTY 2003), are also in danger. In the absence of peacemaking and conflict-resolution efforts in the village itself, the number of court cases is currently increasing. If the prevailing circumstances continue, the situation of poor households is going to become more and more critical, as they are unable to afford the additional financial burden of litigation – hiring lawyers and frequent travel to the administrative centres to attend court hearings.

## 5.9 Summary: The Integration of Innovations into the Traditional System

In the vogue of modernisation and economic integration of the peripheral and remote areas, the whole society in Odier, together with its centuries'-old traditional practices, is at a crossroads. In this transitional process, induced by a monetary economy and changing interdependencies, the reciprocal and collective subsistence strategies are under huge pressure. In the pre-modern situation of joblessness and ready availability of labour force, the old practice of sharing physical labour in co-operative activities was

<sup>230</sup> In this case the students of the *deni marassas* played a major role in forming and fomenting the public opinion. They were deadly against the AKRSP projects and left no stone unturned in their attempts to stop the micro-hydel construction. Although they were unsuccessful in stopping this particular project, the students did achieve some of their objectives: a portion of the village community is still in opposition, and has refused to be connected to the micro-hydel, and more importantly, they succeeded in breaking the village's ties with AKRSP.

relatively easy, compared to sharing money, which is always very difficult to earn, with others. However, the availability of financial capital in the village – as a result of foreign remittances and the possibility of borrowing money for a long-term period without interest – are easing the ever-increasing indebtedness of the villagers to a great extent.

With the high influx of industrial goods, access to an education system lacking in practical training and the rapid increase in out-migration from this village, both cottage industries and indigenous skills are losing ground. More and more young people of this village are being exposed to new ideas that are, to a great extent, irrelevant to their biophysical environment and prevailing way of life. Consequently, the new generation is not the least interested in, or ready to accept, the traditional livelihood mechanisms, and prefers propagating an individualistic way of life. With the passage of time, this individualistic trend is becoming quite visible in the daily life of the households, thus increasing the stress on poor families, although many agro-pastoral activities and infrastructure maintenance responsibilities are still performed by centuries'-old supra-household organisations.

Most of the new innovations and infrastructure management practices, such as road maintenance and operation of the threshing machine, are still following the old models of labour sharing and co-operation. Nevertheless, the delegation of some responsibilities, such as the burial system, to decentralised low-level organisations (clans), and the decreasing effectiveness of conflict-resolution mechanisms at the local level are hitting the poor and minor clan groups of the village very hard. Land development, seasonal out-migration and school attendance have already changed the domain and division of labour in the village to a high degree.

Simultaneously pressure on the available natural resources is growing at an accelerated rate with the increasing animal and human population. Nevertheless, with the introduction of new infrastructures and communal arrangements, the managerial capacities, as well as different forms of interdependencies and collective responsibilities among the villagers are increasing. This trend is encouraging for the collective sustenance of the households, although there have been some negative impacts on the old systems of mutual help and co-operation in the recent years. Nevertheless, the importance of common-property resources is still felt. Despite many innovations and social constraints, the traditional common-property resource management systems are still intact. These systems are still functioning as a main binding factor for the community and providing a hope for future sustainability and conservation of the natural-resource base in the village.

## **6 Transformation and Sustainability in the Eastern Hindu Kush**

As it has been referred to in the introductory chapter that published and unpublished sources of information on resource ownership and management systems are not available on the study area, therefore, this research is mainly based on self-generated data. For this purpose, in addition to group and expert discussions with the well-informed persons of the village, all the 120 households were interviewed for the collection of relevant data. To determine the arable land ownership/occupancy of the individual households IKONOS satellite image of one-meter spatial resolution was used and detailed cadastral map was drawn for the village. In a situation, where no arable land ownership records exist and resource management systems are very complex, without these aforementioned methods it was not possible to achieve the goals of this study. The information collected in the field is organised in four chapters. After introducing the problem in the first chapter, physical and anthropogenic characteristics of the study has been presented in the second chapter. The third chapter dealt with the ownership regimes and utilisation systems of land and water resources. In the following chapter the traditional subsistence strategies in the village were documented in detail. The new developments, changes in the economic and socio-cultural set up were elaborated in the fifth chapter to underline both positive and negative impacts of the modernisation on the traditional systems and responses from the local inhabitants to these transformations.

The present study of resource management systems in the peripheral and marginalised area of the Eastern Hindu Kush presents complex interactions between man and environment in an arid, high mountain milieu. In this context, changing highland-lowland interactions, globalisation processes, economic integration and population pressure have all been considered important factors that have created diverse impacts on the traditional resource management systems in the Mehlp Valley of Chitral District. This study reveals that the recently introduced socio-economic, political and other structural changes are mostly incompatible with the centuries-old communal resource-utilisation mechanisms. These modernisation processes are not only threatening the sustainable functioning of the traditional resource management systems, but are also heavily stressing the associated autochthonous institutions and multi-level village organisations for co-operative activities.

As in other mountainous regions, resource management and utilisation systems in Mehlp Valley are primarily oriented towards long-term assurance of subsistence livelihoods, as well as mitigation of risks and uncertainty factors. To achieve these objectives, different adjustment mechanisms have been applied to all sectors of household economy, including the resource management and utilisation systems themselves. The five essential products for subsistence sustenance – food for the people, forage and fodder for the livestock, firewood for cooking and heating, and timber for construction purposes – are extracted from the available natural resources. Due to shortages and limited availability, these products are brought together from resources kept in different ownership regimes. Any deficiencies are purchased or procured through barter and exchange. The rationale of the natural-resource-utilisation approach is also obvious from the use of the arable land for growing different kinds of food and fodder crops, irrigated pastu-

res and tree plantations. To maintain soil fertility for the next agricultural season, a few fields are also kept under fallow.

Resource ownership and management in Mehlp Valley are complex and composed of multiple subsystems. To understand their functioning, not only geographical literature but also contemporary research on high mountains in the fields of cultural anthropology, economy and political science have been consulted. All of these fields are pertinent to the problem, as resource management is a multidisciplinary subject and human geographers are only one of the interested groups among others, such as planners, economists, political scientists, development workers, non-governmental organisations and anthropologists.

In the Eastern Hindu Kush, the distinguishing characteristics of the ownership and withdrawal rights of natural resources are a result of the traditional political organisation. Individual villages own and manage the natural resources within their territorial limits by themselves. For this purpose, they have established necessary institutional arrangements and organisational set-ups. The existing access and withdrawal rights of the households are complex and usually cut across the conventional boundaries of the four ownership regimes – private property, state property, common property and open access. Here the ownership status of all available natural resources is quasi de jure, and institutional arrangements for common-property resource management can be found at three different levels: i.e. clans, user groups and villages. The respective co-owners have in each case established their own institutions, and are independently devising their own management systems. Nevertheless, a general similarity has been observed in the overall organisational structures and approaches to appropriating resource units, appointing concerned officials, and formulating and implementing rules. Moreover, in addition to natural resources, basic village infrastructures are also treated as communal properties that are repaired and maintained on a self-help basis through locally formed organisations and the mobilisation of communal labour.

The existing resource base, with its low productivity and slow regenerative capacity, is insufficient for the rapidly growing population. Due to topographical and climatic constraints, extension of the arable land is practically limited. Horticulture – an important source of cash income in the low-lying villages of Chitral District – cannot be practised anywhere in the whole of Mehlp Valley due to its excessive altitude. In addition, successive generations of inheritance custom have resulted in the fragmentation of the arable land. More than 80 percent of the total households occupy less than three acres (1.2 hectares) of cultivated land. This phenomenon of stress is quite clear to the residents of the village, and they have responded to it in appropriate and dynamic ways. Within the traditional socio-economic set-up, there were only very limited possibilities for collective management of the arable land. Therefore, the management system of the common property resources has been restructured, and ownership regimes have been redefined in the village.

Accordingly, pastures were allotted to groups of households, and decentralised user groups have been established. This has been adopted to reduce the pressure on forage and firewood resources, both for haymaking and fuel collection. To ensure forage availability for winter and early spring seasons, grazing and haymaking in the nearby

pastures have been strictly forbidden. Likewise, autumn-season free grazing in the summer settlement has been banned, and cultivation has been extended to all favourable sites in the surroundings of the village.

Similarly, detailed plans have been devised for distributing and sharing fodder resources, which are maintained under clan ownership. For this purpose, the co-owners within a clan have been divided into groups, and each year a fixed number of households are allowed to harvest the fodder. Both the management of pasture resources and distribution of fodder at the clan level have proved to be relatively good strategies to avoid uneconomic fragmentation and over-exploitation of pasture and fodder resources. Through rotational allocation of specific shares to the co-owners on a yearly basis and the seasonal opening of pastures for haymaking and firewood collection, the joint-ownership system has also ensured households' access to a certain amount of fodder for winter-season stall feeding, as well as firewood for heating and cooking.

Likewise at the neighbourhood as well as village levels, most of the communal activities that demand a greater threshold population are arranged under different systems of reciprocities and co-operations. The whole village community and the individual clans are both functioning as units in maintaining the infrastructures and sharing the distribution and allocation of fodder. Households in a user group are equally sharing the duties that ensure productivity of the resource base and the smooth running of the organisational structures. At this level, access to resource units is clearly defined, depending on the supply of the resource and its importance for the domestic economy. The necessary rules for allocating shares, ownership, access rights, and all associated responsibilities were all formulated and promulgated in the past, and have been strictly followed up to the present day.

The village's animal husbandry practices also show characteristics of subsistence self-sufficiency and livelihood security, as well as optimal utilisation of available pasture resources. The neighbourhood-level grazing and animal-tending organisations, seasonal shifting of residences, and the ban on collecting fodder from the nearby pastures – measures adopted to ensure the long-term availability of forage and fodder resources for the livestock – are all aspects of mutual co-operation. Turn-based goat grazing and other communal arrangements for tending livestock exhibit optimal utilisation of the available labour force. Animals still play a significant role in the socio-economic set-up of the village. They are not only a basic source of food, but are also the main source of raw material for domestic handicrafts. Throughout the history of the village, livestock and other products derived from domestic handicrafts have remained the principal item of barter and exchange among the households and between the in-laws. Even nowadays, animal husbandry still plays a key role in the traditional agriculture, from maintaining soil fertility to providing draught power for ploughing fields and threshing crops.

From the present study it is also apparent that the functioning of the traditional societies is predominantly based on traditional environmental-knowledge systems. The local inhabitants keep in their mind detailed information on all the different aspects of resource management, access rights and ownership-related matters. This information is quite extensive and also includes the alignment and uses of different types of roads

and paths. Other aspects of agro-pastoral life are similarly integrated into this system of collective group memory. Written records are available only on transfers and sales of cultivated land. Even in this case, proper and exact measurements of the land sold or alienated in other ways are few and far between.

Responsibility for the maintenance and upkeep of basic village infrastructures has been shouldered by the respective users. The households having shares in an irrigation channel are responsible for maintaining the physical system and paying the concerned village official (if any). At the neighbourhood level, the households are conventionally responsible for participating in events related to their neighbours' life cycles and are also accountable for the maintenance and other related duties involved in the up keeping of their mosque. In this case, the contribution of a fixed amount of firewood for the winter season is obligatory for all households of that neighbourhood, irrespective of their presence in the village during the winter season. The clans having watermill ownership are collectively accountable for the functioning of their mill and replacement of necessary parts. In all these cases, each household is a principal stakeholder and is responsible to provide its share in terms of cash or labour, as the case might be, thereby keeping its entitlement to the resource or service in question. Either the village community or the user group, depending on the case, ensures the individual households' shares and access rights to resources. In this regard, most conflicts are resolved at the village level, although in a few cases the state functionaries are approached for justice. Usually the local courts refer such cases back to the village elders for reconsideration and recommendations for a just decision, in any case. A few cases related to family matters and inheritance, however, are also decided in the village according to the Islamic laws.

In the recent past, the villagers have extended their arable land into the nearby pastures, which were previously kept under communal ownership. This was accomplished both on a self-help basis and with the assistance of AKRSP. This changed the existing property rights from communal (group) to individual (household). In many ways these actions have negatively affected the poor households of the village. Most of them have at least partially lost their pastures for seasonal sheep and goat grazing and yearly collection of fodder and fuel wood. Beside this, most of the poor households have also sold their shares of land in the newly reclaimed areas to the relatively wealthy households in the village. Doing so, they became more marginalised and vulnerable to shocks and unexpected situations. At the same time, new arrangements for sheep and goat grazing have also affected those households who do not have a permanent source of cash income.

With the passage of time, the traditional livelihood strategies, i.e. agriculture and animal husbandry, have been thoroughly transformed, and their share in the household economy has substantially decreased. Access to motorised traffic, increasing school attendance, population growth, availability of basic food items in the village shops, and increasing possibilities of generating off-farm income through seasonal out-migration have been the principal driving forces for rapid changes. The pace of change was quite slow until the 1970s. Then it increased as a result of Chitral District's merging with the NWFP to form a regular district. Since the 1980s drastic changes have been experienced, even in the remote villages of the Hindu Kush.



The impacts of modernisation, economic integration and globalisation on the peripheral areas of the mountains are explicit. The increasing dependence on cash and concomitantly important possibilities of earning off-farm income through out-migration to the lowlands, and recently to the Gulf States, has not only changed the traditional division of labour, but also brought the whole structure of traditional resource management and utilisation systems to a crossroads. It has brought changes in land use, cultivated land ownership and cropping patterns, as well as animal husbandry. Population is growing at an unprecedented rate, and the productivity of the common property resources is correspondingly declining. Simultaneously, as a result of successive inheritance and fragmentation the arable land is also under heavy stress. This phenomenon is very badly affecting the productivity of the cultivated land, and the dependency of the villagers on imported food is increasing at a high rate. Even in this case, the local inhabitants are quite successful in responding to the problem. The number of seasonal wage-labour migrants from the village has substantially increased. Meanwhile, participation in international migration is also rapidly increasing. Most of the money thus earned from migration abroad is being invested in the purchase of cultivated land, businesses in the villages as well as Chitral Town, and in the transport sector.

Despite considerable changes in the traditional livelihood strategies, a considerable portion of the basic necessities are still met by locally available natural resources. No drastic changes have been registered in the traditional decentralised resource-management systems in the villages of Mehlp Valley. Other income sources (such as out-migration) are not dependable, as this region is highly prone to both natural hazards and man-made uncertainties. Therefore, combined mountain agriculture is still playing a significant role throughout the whole region as a safety valve, in case other sources of income diminish or dry up, due to internal or external factors (EHLERS & KREUTZMANN 2000b).

To assess the sustainability and resiliency of common-property resource-management systems, contemporary researchers have outlined comprehensive yardsticks (cf. GADGIL & IYER 1989: 241; GIBBS & BROMLEY 1989; OSTROM 1990: 90ff. and OSTROM et al. 1999). Local management systems of common property resources that fulfil these elaborate conditions are considered robust, efficient and sustainable. These principles have furthermore been widely applied to measure sustainability in communal resource-management practices. Relevant studies include WADE (1987a), SINGLETON & TAYLOR (1992), SCHMIDT (2001) and BOLLIG (2002). The following section of this chapter assesses resource management in Mehlp Valley in light of these 'sustainability conditions' or, to use OSTROM's (1990: 90) own phrase, 'design principles'.

### **Clearly Defined Resource Boundaries and Fixed Number of Co-Owners**

From this study, it is obvious that despite some ambiguities in the demarcation of common-property resource boundaries and ensuing conflicts with the neighbouring villages, general consensus exists among the concerned villagers about the existing territorial limits of the pastures. The mutually accepted boundaries are clear to each and every household in the respective villages. The de facto owners carry out seasonal patrols along their territorial limits. Generally, seasonal streams, spurs and other physical landmarks are bordering the pastures. In the case of irrigation water, individual shares

have been fixed in the past, both in terms of the amount of water and duration of time (*sorogh*), for all the main irrigation channels. In this case only, access to irrigation water crosses the accepted village boundaries, and absentee landlords also have their *sorogh* in a few irrigation channels. The shareholders of every irrigation channel are treated as a single group and are independently accountable for the provision of labour and other associated responsibilities.

There are clear rules defining co-owners and the appropriation of resource units. Only regular households of the village are considered co-owners for the collection of firewood from the communally reserved pastures. All the reserved pastures (*saq*) have a clearly defined number of co-owners. In the past, these owners were allowed to grant their annual shares to anybody within or outside of the resource-user community. For about the last five years, however, this practice is no longer in operation. The case of *moshin*, which is kept under clan ownership, is handled quite differently, with extremely complicated distribution and management systems. In this case also, well-defined boundaries demarcate the shares of the individual clans in different pastures, and households or groups of households belonging to one clan own their *moshin* within those limits. According to the traditional rules and customary laws, *moshin* ownership has nothing to do with ownership of the land on which it grows. Usually the *moshin* owners have withdrawal rights only for *moshin* and nothing else, i.e. other fodder or firewood.

### Harmony between Appropriation Rules and Local Conditions

The harmony between appropriation rules and local conditions relevant to the rules formulated for resource extraction and their compatibility with the productivity of the resource base. It also includes the distribution of responsibilities that the co-owners have to shoulder to ensure the successful functioning of the system. With reference to this yardstick, the study of Mehlp Valley shows that appropriation and provision rules reflect the specific attributes of the respective resources. For instance, in the case of irrigation water the shares always remain constant. Only the seasonal rotational cycle among the shareholders is redefined anew after the annual repair of their channel. The pastures reserved for the extraction of firewood are opened for a fixed time period, and the number of loads to be extracted by each shareholder are also fixed beforehand. For this purpose, different sections of the reserved pastures are opened in alternate years, both to avoid overexploitation and to restrict the co-owners to a predefined section of the pasture. The shareholders are allowed to send one able-bodied man per day. In the case of the main pasture (Khotocho gol), special care is taken to provide for the needs of those households who do not have an able-bodied male at home during the opening period. A small section of the pasture opened for firewood extraction is reserved for them, and they are allowed to extract their shares on a single specified day. Firewood from the small birch groves is harvested collectively and then equally divided among the households.

In the case of haymaking, however, the reserved pastures are opened for an unlimited period and no restriction is placed on the amount of fodder that may be extracted. Nevertheless, the next year's regeneration is always kept in mind, and the plants are allowed to mature and shed their seeds before being harvested. For this reason, these

pastures are kept reserved until the first or second week of August. However, to ensure the availability of forage for seasonal sheep and goat grazing, the nearby pastures are kept permanently closed, and no haymaking is allowed within their territorial limits. The fodder resources under clan ownership are extracted through complex yearly rotation patterns, following the old distribution system.

The above-mentioned appropriation rules with respect to pasture resources are suitable to the local circumstances and comparatively easy to implement. Anyone found collecting resource units within the reserved areas before or after the prescribed period is unambiguously breaking the rule and is punished appropriately.

To maintain the essential village infrastructure, material and labour contributions from the respective owner/users is needed. This has been properly organised and equally distributed among the co-owner households. There are clear rules defining the entitlement of the co-owners, as well as the responsibilities they must perform to keep their shares. The prerequisite duties demanded from the respective shareholders vary from case to case. According to this study, the responsibilities associated with irrigation channel maintenance are distributed in such a way among the households that those who receive the highest proportion of water also contribute more labour or cash, as per case. Payment of the channel watchman is also arranged following the same principle. However, in the case of watermill and road maintenance, every household contributes the same amount of money or labour, irrespective of its use of the service.

### **Collective Formulation and Amendment of Operational Rules**

The collective formulation and amendment of operation rules include the power and authority of the shareholders to formulate and implement rules in a common-property resource management system, as well as to check the collective behaviour of the co-owners. The study shows that the inhabitants of Mehlp Valley are independently responsible for formulating their own operational rules. This is important because the local inhabitants are the only ones familiar with the environment and the productivity of the resource base, and can therefore formulate the most appropriate rules for resource utilisation, depending on their needs. Additionally, in circumstances of uncertainty or shortage, they can easily modify the existing appropriation rules. They do not need any external force to help implement these rules. In a closed and traditional society, where credibility, fame and reputation are respected personality traits, compliance of rule is relatively easy.

Most of the rules formulated for the extraction of and access to natural resources, as well as for carrying out other communal responsibilities, are based on the long-term experience of the local people and easy to implement in the existing socio-economic set-up. These rules have become part of the traditional knowledge, and their implementation is without any extra cost. Most of these rules are very easy to understand, and the logic behind them is very clear to the households. All regulations are verbal conventions only and, as such, are transferred from one generation to the next through practical implementation as well as oral narration. In making rules, the individual user groups of the village are independent, and they have the power and authority to upgrade or grant new shares to someone. In contrast, rules formulated without the active participation

of the concerned community are very difficult and costly to enforce, and frequently end up with the community engaging in a game of 'cops and robbers' with outside authorities. In this context, the management of the Khunjerab National Park is an example of a policy failure resulting from the inability and un-preparedness of the government to recognise local-level traditional resource management systems (cf. KREUTZMANN 1995: 225 and BLAIKIE & SADEQUE 2000: 159f.). Such attempts by external authorities to impose new systems not only destroy the well-established institutional structures of the local communities, but also hinder their resilient resource-utilisation practices and conservation activities.

### **Monitoring and Implementation of Sanctions**

The main dilemma in the successful management of common property resources is the 'free riders' problem, or how to exclude unauthorised users. In the study area, all the pastures are kept reserved for most of the year; this makes rule implementation relatively easy within the user groups. The only problem comes from outside, unauthorised users. This necessitates vigilant seasonal patrolling of the territorial boundaries of the pastures. For this purpose, officials have been appointed at user-group levels and, in urgent cases, volunteers are also sent to help them. These officials are accountable to the shareholders and are properly paid for their services. They are responsible for patrolling the pastures and checking for free riders. The officials are motivated by self-interest in checking for unauthorised users: when they catch such a person, they are allowed to confiscate the contraband tools, as well as the illegally collected product. If the defaulter is a member of the co-owner community, the watchmen immediately report this matter to the concerned user group for necessary action.

In a situation where the unauthorised user is a member of the co-owner community, implementation of the sanctions is carried out in public, and the defaulter participates in the whole proceeding. This makes the system more transparent and lays down an example of quick justice. This public shaming and humiliation is one of the most effective mechanisms to stop unauthorised use and control collective behaviour. The villagers, in turn, also monitor the officials, and if anybody is found guilty, the concerned person is immediately removed from his position and punished. The sanctions imposed on a co-owner or an official accountable to the community are graduated, depending on the nature and seriousness of the offence.

### **In-Built Conflict Resolution Procedures**

There are three possibilities of conflict in a common-property resource management system: (a) conflict among the co-owners on the distribution of resource units; (b) conflict between the appointed officials and the community on the timing of produce collection, amount, use of authority and power; and (c) conflict with the neighbouring villagers. In all the villages of Mehlp Valley there are efficient arrangements for conflict resolution. It is the role of the village priests and other elders of the villages to arbitrate disputes on matters ranging from family quarrels to the distribution of cultivated land among brothers planning to establish nuclear families. Other conflicts may be brought before a local court. In any case, due to the unavailability of detailed ownership records, property-related cases are always referred back to the villages for investigation

and recommendation for just decisions. In this way, not only does the local-level conflict-resolution system play a crucial role in providing low-cost justice in the village, but also its authority and decision-making power is, to some extent, recognised by the state functionaries. In most cases, only inter-village conflicts on access and withdrawal rights are taken to the local courts. However, the mutual acceptance of secondary access rights between neighbouring villages greatly eases the situation and keeps litigations to a minimum.

At the village level, there are no conflicts over the usage of common property resources; however, in case of any confusion on the share of irrigation water in a channel, alignment of channels or communal paths, etc. the village elders are always approached for clarification and resolution of the problems. Such cases are usually presented to the village elders on Friday after the congregation. The elders listen carefully and conduct a detailed discussion, then a verbal decision is made on the spot. These decisions are always based on practical evidence, such as physical witnesses, and traditional utilisations and old usage patterns.

### Minimum Recognition by the State Authorities

Minimum intervention of the state functionaries is another important factor for the successful functioning of common-property resource management systems at a local level. It has usually been outside interference that has changed the functioning of local resource-management institutions, leading subsequently to an open-access situation and finally to the popularly known tragedy of the commons. In the study area, it is clear that the state has recognised the de facto ownership of the village communities, and there is almost no intervention from the government in matters related to village-level resource management and utilisation systems. The villagers are responsible for formulating operation and appropriation rules by themselves, and have the power of implementation as well. The villagers of Odier have formed user groups and distributed resource units independently – a process that has been informally accepted by the state authorities.

In the villages of Mehlp Valley, the power and authority of the user groups is so strong that nobody ventures to challenge the existing rules in the courts. At the same time, there are common conventions at inter-village levels that individual *moshin* ownerships cannot be presented in court as a proof for the ownership of land or any other products thereof. Furthermore, at the village level the different user groups function independently of each other, i.e. one group does not intervene in the affairs of another. For example, irrigation water is treated separately from pasture resources. Although both are common property resources, each has its own organisation, rules and associated responsibilities. Similarly, pastures reserved for firewood are handled independently of others reserved for forage or haymaking. Thus there are specific rules for each sub-system, keeping them separate from each other.

Long-term de facto rights are also considered equal to de jure rights. In the study area, the decisions of the lower courts on the inter-village pasture ownership conflicts acknowledged the existing de facto rights as quasi de jure rights. In regard to individual shares of the common property resources, there is no evidence that any individual has

ever challenged the prevailing system and approached the state authorities to amend the existing shares and appropriation rules. This clearly shows the importance of the locally formulated rules and withdrawal rights, the adherence of the villagers to these rules, as well as the government's general policy not to interfere in such matters.

### **Long-Term Interaction Among the Co-Owners**

Interaction among resource users is essential for the formulation of rules and regulations, and for providing positive feedback for modifications and amendments in the existing rules. Furthermore, it is one of the main factors for developing mutual trust and strengthening the local institutions. In all the villages of Mehlp Valley, the households interact with each other constantly. The attendance at neighbourhood mosques, which occurs many times each day, provides an opportunity for discussion of day-to-day matters. Most information is shared in this way, and necessary decisions are made regarding infrastructure maintenance and resource management. The weekly Friday congregations at the central village mosques also provide a chance for discussion and village-level decision-making. In this way the concerned groups and the whole village community review many things, such as the opening of reserved pastures, maintenance of jeepable roads, performance of the responsible groups, etc. Marriages and funerals are also important events where the majority of the households in the villages interact.

Moreover, the inhabitants of Mehlp Valley intend to remain in their respective villages for an unlimited time in the future. Therefore, they would like to retain access rights and shares in common-property resources for their future generations. This important built-in motivation for investing in the common-property resources and village infrastructures gives the villagers a common stake in the village resources. Based on their vested interest, life-long experience and locally developed managerial capacity, they have formulated improved mechanisms for managing their common-property resources (cf. GRIMA & BERKES 1989). Such an approach is one of the prerequisites for sustainable development. Contrary to this, neither government officials nor the workers of other non-governmental agencies have this fundamental incentive for designing and implementing sustainable development (see below).

### **Kinship and Reciprocal Relationships Among the Shareholders**

The resource users are not only connected with each other for resource management purposes, but also for the performance of many other activities. Within the village, the villagers have developed bilateral kinship and reciprocal relationships as well as other non-reciprocal obligations, organised at different levels. Thus they can utilise their social capital for resolving common-property-related problems. Odier, the village under study, shows a strong endogamous character. In 2001, 56 percent of the total married men had spouses from the same village, and an additional 22 percent, from the Mehlp Valley. There are very clear rules for maintaining communal obligations and reciprocal relationships among the households. The individual households are responsible for performing communal duties at different levels, ranging from small neighbourhoods to the whole village. It is not possible for a single household to live on its own; rather, it is heavily dependent on its neighbours, as well as on its clan and other villagers. The agro-pastoral activities, maintenance and repair of the basic village infrastructures and

the performance of family matters relevant to life cycles all need more labour force than a single household can provide. Additionally, due to inequalities in material resources, the level of the households' dependency on each other is very high in the study area. This has resulted in the development of various organisations for co-operative undertakings. Most of these activities are based on a system of compulsory participation and contribution of labour force. The different social units are tied to each other and made responsible for their respective contributions.

Thus the common-property resource management systems in the study area show all the characteristics of efficiency, stability, resiliency and equitableness. The local resource management institutions, however, need more authority, empowerment and recognition from the government. For sustainable resource management, the grass-roots-level institutions need to be further strengthened. With this proviso, similar village-based resource management systems could be transferred to other villages of the Hindu Kush, Karakorum and Himalayan region with similar conditions or settings.

There are, however, some important considerations relevant to the transferability of community-based management systems to other mountainous regions. These pertain to strengthening the local resource management systems, which in turn paves the way to achieving local-level sustainable development. Therefore, it is suggested that the authority and functioning capacity of the local village organisations should be recognised before conferring *de jure* property rights on them. Secondly, public participation in both development and conservation issues should be ensured, to facilitate local-level institutional development.

To successfully transfer resource management systems from the study area to other localities in the northern mountainous belt of Pakistan, several factors must be taken into account. Some of the relevant issues are briefly elaborated below. Nevertheless, there is a need for further in-depth and interdisciplinary research, particularly in the fields of resource management, livelihood-security mechanisms, traditional knowledge systems and rural development in the Eastern Hindu Kush, as well as in other mountainous regions of the developing world. The following deliberations refer particularly to the northern mountainous belt of Pakistan.

The whole of Eastern Hindu Kush and considerable parts of the Hindu Kush, Himalayan and Karakorum regions are still unsettled and lack detailed land-ownership records (BLAIKIE & SADEQUE 2000 and Chitral Conservation Strategy n.d: *passim*). There is, of course, an urgent need for detailed land registration and clarification of property rights. This is very important and has been considered one of the main prerequisites for future human security in the region (cf. MATTHEW 2001). A clear solution to this problem is imperative. Also, high-level political commitment is required to accomplish such systematic land-settlement records, not only in Chitral district but also in the surrounding areas. Proper definition of property rights is an absolute necessity for appropriate resource management and sustainable development.

Throughout the whole Eastern Hindu Kush, lack of clarity in property rights together with the old system of political organisation led to the development of very complicated systems of resource ownership and utilisation patterns, at both intra- and inter-village

levels. Therefore, it is necessary to recognise the existing resource management systems at the micro level, before conferring legitimate property rights on the concerned villagers and individual households. At village levels, this requires a detailed documentation of the existing ownership systems, access and withdrawal rights as well as management mechanisms. Then the operational structure and functioning authority of the existing local institutions should be properly organised and further strengthened through new legislation, rather than simply establishing new institutions (cf. BLAIKIE & SADEQUE 2000: 186 and STEVENS 1993: 326). In the case of the Eastern Hindu Kush region, the local government systems newly established in 2001 can easily carry out these tasks.

To attain this objective, the detailed pre-settlement reports from parts of the Northern Areas of Pakistan should be used as guidelines. Moreover, the local-level research studies conducted within the CAK programme in the Northern Areas of Pakistan are a major source of necessary information on the prevailing resource management systems, e.g. LENTZ (2000); SCHMIDT (2000b, 2001) and CLEMENS (2001). Consulting these documents and research studies is strongly suggested, to avoid post-settlement conflicts among the villagers, as well as between the villagers and the government officials.

Studies on resource management in the northern mountainous belt of Pakistan reveal that the establishment and institutional organisation of resource management systems at the union council level are problematic. Organisation at this level does not function well because, in practice, ownership of and access rights to resources are generally held by the individual villages (cf. EHLERS 1996: 23). Nevertheless, in many cases neighbouring villagers do have some secondary utilisation rights. There might be other disputes among the neighbouring villages, and quite often the so-called 'democratic' processes – particularly union council elections – provoke exactly such antagonistic situations (cf. POLZER 1998). Some of the pasture boundaries between the neighbouring villages are still not very clearly demarcated. However, in many cases there are well-established institutions for conflict resolution that can easily be revived, strengthened and modified according to the arising needs. In a real sense, the functioning of the traditional system in the villages cannot be considered democratic or egalitarian in character. Although the majority of the households always have the say, there are wide disparities in power sharing among the households.

To enhance the functional capacity of village-based resource management systems, the sense of equity and empowerment need to be strengthened – particularly through governmental acknowledgement. In this regard, there is no need for drastic measures to be imposed from external sources. Rather, when the prevailing system needs some modification or improvement in equity and entitlement matters, then the possibility of participatory appraisals should be adopted. The entire community should be taken into confidence. Members of NGOs or government institutions can play the role of arbitrator and mediator. The decision-making power of the communities needs to be respected. Such measures are necessary to avoid rivalry and conflicts at the village level, and, in turn, to help build confidence among the villagers themselves as well as between the villagers and development workers and institutions.

Generally, the negative impacts of development activities in the mountainous areas are becoming more and more evident. The important causal reason behind this is that most



of the development plans are formulated in the lowlands, and neither the mountain specificities nor the locally adopted mechanisms are being properly integrated. Most of the planning process is carried out by means of a conventional top-down approach, without the participation of the local inhabitants. These development projects are always politically motivated – and are resultantly short-lived. The development projects are frequently not properly completed, either due to the unavailability of funds or to changes in the political set-up. In addition, these development projects quite often do not address the felt needs of the local inhabitants; rather, they are initiated by donors or ruling political parties. For this main reason, the local inhabitants do not take any interest in the completion and maintenance of such projects; and are not motivated to provide the necessary self-help. In fact, the villagers are capable of undertaking such work, as they have demonstrated regularly in their maintenance of the basic village infrastructures – an exertion they have been practising for generations. Successful development work could be very easily achieved and transferred to other villages if the local inhabitants were consulted and taken into confidence, thus ensuring their participation in the planning and implementation of the projects

The existing practices of infrastructure maintenance throughout the whole Hindu Kush, Himalayan and Karakorum regions could be further strengthened and encouraged by allocating some money to the concerned villagers.<sup>231</sup> As they are responsible for the maintenance work and have long-term experience, they can at least be expected to be better than a government-registered contractor, who has little or no interest at all in the village infrastructures. The same is true of the officials in the different line departments responsible for rural development and maintenance of basic physical infrastructures: they too are only interested in their commission on the contract. This point of view has been very clearly expressed by a local contractor in Chitral regarding the construction of government-sponsored irrigation channels:

*“We all know that the old dry-stone channels worked well; they even got stronger year by year, bound by the roots of trees and grass. But for a contractor there is no profit. So we call in the engineers, and we make it ‘pukkah’ [lined] with cement, even if it may collapse [due to the extremely low temperatures during the winter season] in a year or two. But then, there will be another contract....”* (PARKES 2001: 6) (Sic)

Another relevant factor for sustainable development in the region is that the whole population of the Eastern Hindu Kush is divided on religious lines. It is necessary to consider this aspect (among others) particularly in villages where one religious sect – i.e. *Sunni*, *Shia* or *Ismaili* – is in the majority. Generally the minority groups are suppressed and marginalised, irrespective of their social status. In the remote villages, this rivalry is a new phenomenon, and throughout the whole Northern Areas and Chitral it has only become very critical since the early 1980s. Following the religious riots of 1982 in Chitral and 1988 in Gilgit, the distrust between the sects has further intensified, and

<sup>231</sup> According to the available information on irrigation collected from the website of the Chitral Conservation Strategy (cf. [www.http://ccs.iucn.org-irrigation.pdf](http://ccs.iucn.org-irrigation.pdf), n.d: 6f.), the district council of Chitral is yearly spending Rs. 25 million for the maintenance of only 13 state-owned irrigation channels in the district. Registered contractors of the district council carry out the yearly maintenance work on the respective channels through open tenders.

the individual sects have started consolidating themselves as a group, irrespective of socio-economic and other differences (SÖKEFELD 1997 and SCHMIDT 2001). The different religious parties based in the lowlands are actively taking advantage of this situation, to extend their influence into the very remote villages of the northern mountainous belt of Pakistan. This is explicitly demonstrated by the reaction against the rural development programmes of AKRSP in the lower part of Chitral district, where the Sunni-dominated population has not yet accepted this NGO's participatory development programmes.

With the passage of time, however, the bilateral relations between religious groups at village level are improving to a considerable extent. This is particularly true in the far-flung areas of the northern mountain region, whose main administrative centres were the areas worst affected by religious conflicts. There is a dire need to alleviate this mistrust and to develop an amicable environment among the different religious groups. In the remote areas, despite their many differences the villagers are still connected with and dependent on each other, due to their complex network of multi-level co-operative systems and reciprocal responsibilities.

The introduction of a monetary-based economy is also quite problematic. This has negative repercussions on co-operative activities, and places all different kinds of reciprocities under stress, as well. It is one of the main factors that increases the gulf between households, and it also tends to promote an individualistic way of life. In this way, this process is also undermining the villagers' collective sense of enterprise. On the other hand, it is a fact that without sufficient cash income, the ever-increasing population cannot be fed properly, not to mention satisfying all its other needs. The village banking system initiated by AKRSP, with its credit facilities, is comparatively better than the state-run financial institution in regard to the mark-up rates and access to credit it offers; nevertheless, the poor households are always disfavoured in one way or another. Compared to the credit facilities offered by the state and the AKRSP-run village banking system, the money-lending system in Odier Village is quite flexible and substantially better for the poor households, as loans and credits are mostly interest-free and there is no fixed time schedule for repayment. The traditional system of borrowing from the village shops (*khata*) is very effective, and is the only possible way of getting credit in emergency situations without extra formalities.

Based on this study it is concluded that the long-term successful resource management and sustainable development of the high mountain regions lies in:

- recognition of locally established institutions
- empowerment of the mountain communities and
- revision of the conventional approaches of developmental planning and natural resource utilisation.

## 7 References

- AASE, T.H. (1998): Politics of Natural Resource Management in the Sai Valley, Gilgit District. In: STELLRECHT, I. (Ed.): Karakorum – Hindukush – Himalayas: Dynamics of Change. Köln. (= Culture Area Karakorum Scientific Studies 4/II), 109-123.
- AASE, T.H. (1999): Converting Forest into Weapons in the Western Himalayas. In: PRICE, M. (Ed.): Global Change in the Mountains. New York, 147-149.
- ADAMS, W.M., D. BROCKINGTON, J. DYSON & B. VIRA (2003): Managing Tragedies: Understanding Conflict over Common Pool Resources. In: *Science* 302, 1915-1916.
- ADAMS, W.M., T. POTKANSKI & J.E.G. SUTTON (1994): Indigenous Farmer-Managed Irrigation in Sonjo, Tanzania. In: *The Geographical Journal* 160(1), 17-32.
- ADEDIPE, N.O., J.E. OLAWOYE, E.S. OLARINDE & A.Y. OKEDIRAN (1997): Rural Communal Tenure Regimes and Private Land Ownership in Western Nigeria. In: *Land Reforms* 2, 99-110.
- ADEGEYE, A.J. (1975): Principles of Land Inheritance: The Example of Nigeria. In: *Land Reforms* 1, 62-71.
- ADEGBOYE, R.O. (1971): Customary Land Tenure Systems in Uganda. In: *Land Reform – Land Settlement and Cooperatives* 1, 68-71. FAO Rom.
- AGRAWAL, A. (1995): Dismantling the Divide between Indigenous and Scientific Knowledge. In: *Development and Change* 26(3), 413-439.
- AKRSP (2000): An Assessment of Socio-economic Trends and Impact in Northern Pakistan. Findings from AKRSPs' Farm Household Income and Expenditure Surveys. Gilgit.
- ALAUDDIN (1992): *Kalash. The Paradise Lost*. Lahore.
- ALDER, G. J. (1963): *British India's Northern Frontier 1865-95. A Study in Imperial Policy*. London. (= *Imperial Studies* 25)
- ALI, A. & J. LE FEVRE (1996): *Indigenous Knowledge of Plant Use. An Ethnobotany of Chitral with Particular Reference to Medicinal Plants*. AKRSP, Chitral.
- ALLAN, N.J.R. (1984a): Changing Crop Complexes in the North Pakistan Foothills. In: *Geography* 69, 261-263.
- ALLAN, N.J.R. (1984b): Ecological Effects of Land Intensification in the Central and Eastern Hindukush. In: GRÖTZBACH, E. & G. RINSCHDEDE (Eds.): *Beiträge zur vergleichenden Kulturgeographie der Hochgebirge*. Regensburg, (= *Eichstätter Beiträge* 12), 193-212.
- ALLAN, N.J.R. (1985a): Periodic and Daily Markets in the Highland-Lowland Interaction Systems: Hindukush-Western Himalaya. In: SINGH, T.V. & J. KAUR (Eds.): *Integrated Mountain Development*. New Delhi. 239-256.
- ALLAN, N.J.R. (1985b): Human Geo-ecological Interactions in Kuh Daman, a South Asian Mountain Valley. In: *Applied Geography* 5, 13-27.

- ALLAN, N.J.R. (1986a): Communal and Independent Mountain Irrigation Systems in North Pakistan. In: MUSHTAQR-RAHMAN (Ed.): Proceedings of the First International Irrigation Conference. Lahore. (= Water & Power Development Authority (WAPDA), 82-96.
- ALLAN, N.J.R. (1986b): Accessibility and Altitudinal Zonation Models of Mountains. In: Mountain Research and Development 6(3), 185-206. [including comments]
- ALLAN, N.J.R. (1987a): Impact of Afghan Refugees on the Vegetation Resources of Pakistan's Hindukush-Himalaya. In: Mountain Research and Development 7(3), 200-204.
- ALLAN, N.J.R. (1987b): Ecotechnology and Modernisation in Pakistan Mountain Agriculture. In: PANGTEY, T.P.S. & S.C. JOSHI (Eds.): Western Himalaya: Environment, Problems and Development. Vol. II, Nainital. 771-787.
- ALLAN, N.J.R. (1989): Kashgar to Islamabad: The Impact of the Karakorum Highway on Mountain Society and Habitat. In: The Scottish Geographical Magazine 105(3), 130-141.
- ALLAN, N.J.R. (1990): Household Food Supply in Hunza Valley, Pakistan. In: The Geographical Review 80(4), 399-415.
- ALLAN, N.J.R. (1991): From Autarky to Dependency: Society and Habitat Relations in the South Asian Mountain Rimland. In: Mountain Research and Development 11(1), 65-74.
- ALLEN, B.J. (1988): Adaptation to Frost and Recent Political Change in Highland Papua New Guinea. In: ALLAN, N.J.R., G.W. KNAPP & C. STADEL (Eds.): Human Impact on Mountains. Totowa, New Jersey. 255-264.
- ANWAR-UL-HAQ, M. & K. IJAZ (1996): Demographic Characteristics of Chitral. In: BASHIR, E. & ISRAR-UD-DIN (Eds.): Proceedings of the Second International Hindukush Cultural Conference. Karachi. (= Hindukush and Karakorum Studies 1), 59-65.
- ARNOLD, J.E.M. & W.C. STEWART (1991): Common Property Resource Management in India. Oxford Forestry Institute, Department of Plant Sciences, University of Oxford, U.K. (= Tropical Forestry Papers 24)
- ASEER, S.W.K. (1996): The Marriage of Daughter in Chitral. In: BASHIR, E. & ISRAR-UD-DIN (Eds.): Proceedings of the Second International Hindukush Cultural Conference. Karachi. (= Hindukush and Karakorum Studies 1), 201-208.
- AZHAR-HEWITT, F. (1998): All Paths Lead to the Hot Spring: Conviviality, the Code of Honor, and Capitalism in a Karakorum Village, Pakistan. In: Mountain Research and Development 18(3), 265-272.
- AZHAR-HEWITT, F. (1999): Women of the High Pastures and the Global Economy: Reflections on the Impacts of Modernization in the Hushe Valley of the Karakorum, Northern Pakistan. In: Mountain Research and Development 19(2), 141-151.
- AZHAR, R.A. (1989): Communal Property Rights and Depletion of Forest in Northern Pakistan. In: The Pakistan Development Review Islamabad 28(4), 643-651.

- AZIZ-UD-DIN, M.M. (1897): *Tarikh-i-Chitral*. [History of Chitral] Agra. [Urdu, Reprint: Lahore 1991].
- BAIG, R.K. (1990): REVENUE System of the Ex-State of Chitral. In: *Terichmer Magazine*. Peshawar, 5: 5-7&12 (= Yearly Journal of Chitrali Students, University of Peshawar).
- BAIG, R.K. (1994): *Hindu Kush Study Series*. Vol. I. Peshawar.
- BAIG, R.K. (1996): Defence Organization of the Former State of Chitral: Strategy of Collective Responsibility. In: BASHIR, E. & ISRAR-UD-DIN (Eds.): *Proceedings of the Second International Hindukush Cultural Conference*. Karachi. (= *Hindukush and Karakorum Studies* 1), 139-145.
- BAIG, R.K. (1997): *Hindu Kush Study Series*. Vol. II. PESHAWAR.
- BAKER, J.M. (1997): Common Property Resource Theory and the Khul Irrigation Systems of Himachal Pradesh, India. In: *Human Organization* 56(2), 199-208.
- BALLAND, D. (1988): Nomadic Pastoralists and Sedentary Hosts in the Central and Western Hindukush Mountains, Afghanistan. In: ALLAN, N.J.R., G.W. KNAPP & C. STADEL (Eds.): *Human Impact on Mountains*. Totowa, New Jersey. 265-276.
- BANDYOPADHYAY, J. (1992): Sustainability and Survival in the Mountain Context. In: *Ambio* 21(4), 297-302.
- BANSKOTA, M. (2000): The Hindu Kush-Himalayas: Searching for Viable Socio-economic and Environmental Options. In: BANSKOTA, M., T.S. PAPOLA & J. RICHTER (Eds.): *Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia*. Deutsche Stiftung für Internationale Entwicklung, Feldafing. 57-105.
- BANSKOTA, M., T.S. PAPOLA & J. RICHTER (2000): Development in Mountain Areas of South Asia – Issues and Options. In: BANSKOTA M., T.S. PAPOLA & J. RICHTER (Eds.): *Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia*. Deutsche Stiftung für Internationale Entwicklung, Feldafing. 31-55.
- BARTH, F. (1956a): *Indus and Swat Kohistan: An Ethnographic Survey*. Studies Honouring the Centennial of Universitetets Ethnografiske Museum. Vol. II. Oslo.
- BARTH, F. (1956b): Ecologic Relationships of Ethnic Groups in Swat, North Pakistan. In: *American Anthropologist* 58(6), 1079-1089.
- BASHIR, E. & ISRAR-UD-DIN (Eds.) (1996): *Proceedings of the Second International Hindukush Cultural Conference*. Karachi. (= *Hindukush and Karakorum Studies* 1)
- BEBBINGTON, A. (1998): Sustaining the Andes? Social Capital and Policies for Rural Regeneration in Bolivia. In: *Mountain Research and Development* 18(2), 173-181.
- BEBBINGTON, A & A. KOPP (1998): Networking and Rural Development Through Sustainable Forest Management: Frameworks for Pluralistic Approaches. In: *Unasyuva* 194(49), 12-18.

- BECKER, A. & H. BUGMANN (Eds.) (2001): *Global Change and Mountain Regions. The Mountain Research Initiative*. Stockholm. (= IGBP Report 49, GTOS Report 28, IHDP Report 13).
- BEIER, C. & J. RENGER (2003): *Entwicklungszusammenarbeit im Wandel – Herausforderungen für den Brückenschlag von Wissenschaft und Praxis*. In: *Petermanns Geographische Mitteilungen* 147(1), 74-83.
- BERKES, F. (1989): *Cooperation for the Perspective of Human Ecology*. In: BERKES, F. (Ed.): *Common Property Resources: Ecology and Community-based Sustainable Development*. London. 70-88.
- BERKES, F., D. FEENY, B.J. MCCAY & J.M. ACHESON (1989): *The Benefits of the Commons*. In: *Nature* 340, 91-93.
- BERKES, F., I. DAVIDSON-HUNT & K. DAVIDSON-HUNT (1998): *Diversity of Common Property Resource Use and Diversity of Social Interests in the Western Indian Himalaya*. In: *Mountain Research and Development* 18(1), 19-33.
- BERKES, F. & M.T. FARVAR (1989): *Introduction and Overview*. In: BERKES, F. (Ed.): *Common Property Resources: Ecology and Community-based Sustainable Development*. London. 1-17.
- BHATIA, A. (1997): *Power, Equity, Gender and Conflicts in Common Property Resources in the Hindukush-Himalayas*. ICIMOD, Kathmandu. (= *Issues in Mountain Development Discussion Paper* 7).
- BHATIA, A. (2000): *Participatory Forest Management (PFM): Rediscovery of a Promising Mechanism for Poverty Alleviation in the Mountain Areas of South Asia*. In: BANSKOTA, M., T.S. PAPOLA & J. RICHTER (Eds.): *Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia*. Deutsche Stiftung für Internationale Entwicklung, Feldafing. 445-484.
- BIDDULPH, J. (1880): *Tribes of the Hindoo Koosh*. London. [Reprinted, Graz 1974].
- BISHOP, B.C. (1978): *The Changing Geocology of Karnali Zone, Western Nepal Himalaya: A Case of Stress*. In: *Arctic & Alpine Research* 10(2), 531-543.
- BISHOP, B.C. (1990): *Karnali under Stress: Livelihood Strategies and Seasonal Rhythms in a Changing Nepal Himalaya*. (=University of Chicago, Geography Research Paper Nos. 228-29).
- BJØNNES, I.M. (1983): *External Economic Dependency and Changing Human Adjustment to Marginal Environment in High Himalaya, Nepal*. In: *Mountain Research and Development* 3(3), 263-272.
- BLAIKIE, P. & H. BROOKFIELD (Eds.) (1987): *Land Degradation and Society*. London, Methuen.
- BLAIKIE, P.M. & S.Z. SADEQUE (2000): *Policy in High Places: Environment and Development in the Himalayan Region*. Kathmandu.
- BOKHARI, A.S. (1981): *Role of Rural Organisations in Rural Development*. In: *Journal of Rural Development and Administration* 15(1), 76-84.

- BOHLE, H.-G. (2001): Neue Ansätze der geographischen Risikoforschung: Ein Analyserahmen zur Bestimmung nachhaltiger Lebenssicherung von Armutgruppen. In: *Die Erde* 132(2), 119-140.
- BOHLE, H.-G. & J. ADHIKARI (1998): Rural Livelihoods at Risk: How Nepalese Farmer Cope with Food Insecurity. In: *Mountain Research and Development* 18(4), 321-332.
- BOLLIG, M. (2002): Problems of Resource Management in Namibia's Rural Communities: Transformation of Land Tenure between State and Local Community. In: *Die Erde* 133(2), 155-182.
- BROMLEY, D.W. (1989): Property Relations and Economic Development: The Other Land Reform. In: *World Development* 17(6), 867-877.
- BROMLEY, D.W. (1991): *Environment and Economy: Property Rights and Public Policy*. Cambridge.
- BROMLEY, D.W. (1992): The Commons, Property, and Common-property Regimes. In: BROMLEY, D.W. (Ed.): *Making the Commons Work. Theory, Practice, and Policy*. California. 3-15.
- BROMLEY, D.W. & M.M. CERNEA (1989a): Management of Common Property Natural Resources: Overview of Bank Experiences. In: MEYERS, L.R. (Ed.): *Innovation in Resource Management. Proceedings of the Ninth Agricultural Sector Symposium*. The World Bank, Washington D.C. 29-45.
- BROMLEY, D.W. & M.M. CERNEA (1989b): The Management of Common Property Natural Resources: Some Conceptual and Operational Fallacies. Washington D.C. (= World Bank Discussion Paper 57).
- BROWN, T. (1999): The Persistence of the Commons in Northeast Nepal. In: PRICE, M. (Ed.): *Global Change in the Mountains*. New York. 167-168.
- BRUSH, S.B. (1976a): Introduction to the Proceedings of the Symposium on Cultural Adaptations of Mountain Ecosystems. In: *Human Ecology* 4(2), 125-133.
- BRUSH, S.B. (1976b): Man's Use of an Andean Ecosystem. In: *Human Ecology* 4(2), 147-166.
- BRUSH, S.B. (1982): The Natural and Human Environment of the Central Andes. In: *Mountain Research and Development* 2(1), 19-38.
- BRUSH, S.B. (1988): Traditional Agricultural Strategies in Hill Lands of Tropical America. In: ALLAN, N.J.R., G.W. KNAPP & C. STADEL (Eds.): *Human Impact on Mountains*. Totowa, New Jersey. 116-132.
- BRUSH, S.B. & D.W. GUILLET (1985): Small Scale Agro-pastoral Production in the Central Andes. In: *Mountain Research and Development* 5(1), 19-30.
- BUCK, S.J. (1989): Cultural Theory and Management of Common Property Resources. In: *Human Ecology* 17(1), 101-116.
- BÜTTNER, H. (2001): Wassermanagement und Ressourcenkonflikte: Eine empirische Untersuchung zu Wasserkrise und *Water Harvesting* in Indien aus der

Perspektive sozialwissenschaftlicher Umweltforschung. Saarbrücken. (= Studien zur Geographischen Entwicklungsforschung 19).

- BUTZ, D. (1994): A Note on Crop Distribution and Micro-environmental Conditions in Holshal and Ghoshushal Villages, Pakistan. In: Mountain Research and Development 14(1), 89-97.
- BUTZ, D. (1996): Sustaining Indigenous Communities: Symbolic and Instrumental Dimensions of Pastoral Resource Use in Shimshal, Northern Pakistan. In: The Canadian Geographer 40(1), 36-53.
- BUTZ, D. (1998): Orientalist Representations of Resource Use in Shimshal, Pakistan, and their extra-discursive Effects. In: STELLRECHT, I. (Ed.): Karakorum-Hindukush-Himalaya: Dynamics of Change. Köln. (= Culture Area Karakorum Scientific Studies 4/I), 357-386.
- BUZDAR, N. (1988): Property Rights, Social Organisation, and Resource Management in Northern Pakistan. Honolulu. (= Environment and Policy Institute East-West Center Working Paper 5)
- CASIMIR, M.J. & A. RAO (1985): Vertical Control in the Western Himalaya: Some Notes on the Pastoral Ecology of the Nomadic Bakrwal of Jammu and Kashmir. In: Mountain Research and Development 5(3), 221-232.
- CHAKRAVARTY-KAUL, M. (1998): Transhumance and Customary Pastoral Rights in Himachal Pradesh: Claiming the High Pastures for Gaddis. In: Mountain Research and Development 18(1), 5-17.
- CHAUDHARY, M.A. (1997): *Maruts*: Gold-Washer of the Indus. In: STELLRECHT, I. & M. WINIGER (Eds.): Perspectives on History and Change in the Karakorum, Hindukush and Himalaya. Köln. (= Culture Area Karakorum Scientific Studies 3), 431-462.
- CHAVERRI-POLINI, A. (1998): Mountains, Biodiversity and Conservation. In: Unasylva 195(49), 47-54.
- CIRIACY-WANTRUP, S.V. & R.C. BISHOP (1975): "Common Property" as a Concept in Natural Resources Policy. In: Natural Resource Journal 15, 713-727.
- CLARK, G.L. (1982): Rights, Property and Community. In: Economic Geography 58(2), 120-138.
- CLEMENS, J. (1997): Resource Management in Astor (Gilgit Wazarat) since the Partition of Kashmir. Natural Setting, Utilization Rights and Modern Impacts on Alpine Pastures and Forests. In: DODIN, T. & H. RÄTHER (Eds.): Proceedings of the 7th Colloquium of the International Association for Ladakh Studies, held in Bonn/Sankt Augustin, 12-15 June 1995. Ulm (= Recent Research on Ladakh 7), 105-116.
- 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. Köln. (= Culture Area Karakorum Scientific Studies 4/I), 475-496.



- CLEMENS, J. (2000): Rural Development in Northern Pakistan. Impacts of the Aga Khan Rural Support Programme. In: DITTMANN, A. (Ed.): *Mountain Societies in Transition. Contributions to the Cultural Geography of the Karakorum*. Köln. (= Culture Area Karakorum Scientific Studies 6), 1-35.
- CLEMENS, J. (2001): Ländliche Energieversorgung in Astor: Aspekte des nachhaltigen Ressourcenmanagements im nordpakistanischen Hochgebirge. Bonn. (= Bonner Geographische Abhandlungen 106).
- CLEMENS, J. & M. NÜSSER (1994): Mobile Tierhaltung und Naturraumausstattung in Rupal-Tal des Nanga Parbat (Nordwesthimalaja): Almwirtschaft und sozio-ökonomischer Wandel. In: Petermanns Geographische Mitteilungen 138(6), 371-387.
- CLEMENS, J. & M. NÜSSER (1996): Animal Husbandry and Socio-economic Development: Persistence and Transformation, A Nanga Parbat Case Study. In: *Pakistan Journal of Geography* 5/6 (1/2), 45-59.
- CLEMENS, J. & M. NÜSSER (1997): Resource Management in Rupal Valley, Northern Pakistan: The Utilization of Forests and Pastures in the Nanga Parbat Area. In: STELLRECHT, I. & M. WINIGER (Eds.): *Perspectives on History and Change in the Karakorum, Hindukush and Himalaya*. Köln. (= Culture Area Karakorum Scientific Studies 3), 235-263.
- CLEMENS, J. & M. NÜSSER (2000): Pastoral Management Strategies in Transition: Indicators from the Nanga Parbat Region (NW-Himalaya). In: EHLERS, E. & H. KREUTZMANN (Eds.): *High Mountain Pastoralism in Northern Pakistan*. Stuttgart. (= Erdkundliches Wissen 132), 151-187.
- COBB, E.H. (1951): The Frontier States of Dir, Swat and Chitral. In: *Journal of Royal Central Asian Society* 38(2/3), 170-176.
- COLEMAN, J.S. (1988): Social Capital in the Creation of Human Capital. In: *American Journal of Sociology* 94 Supplement, S95-S120.
- CONWAY, G.R. (1987): The Properties of Agroecosystems. In: *Agricultural Systems* 24, 95-117.
- COWARD, E. W. JR. (1979): Principles of Social Organization in an Indigenous Irrigation System. In: *Human Organization* 38(1), 28-36.
- COWARD, E. W. JR. (1990): Property Rights and Network Order: The Case of Irrigation Works in the Western Himalayas. In: *Human Organization* 49(1), 78-88.
- CRAMER, T. (1996): Humidity and Growing Conditions in the Karakoram Mountains. In: *Pakistan Journal of Geography* 5/6(1/2), 87-96.
- CRAMER, T. (1997): Climatic Gradients in the Karakorum and their Effects on the Natural Vegetation. In: STELLRECHT, I. & M. WINIGER (Eds.): *Perspectives on History and Change in the Karakorum, Hindukush and Himalaya*. Köln. (= Culture Area Karakorum Scientific Studies 3), 265-276.
- CRITCHLEY, W. (1999): Harnessing Traditional Knowledge for better Land Husbandry in Kabale District, Uganda. In: *Mountain Research and Development* 19(3), 261-272.

- CROOK, J. & H. OSMASTON (Eds.) (1994): *Himalayan Buddhist Villages: Environment, Resources, Society and Religious Life in Zangskar, Ladakh*. Bristol.
- CURZON, G.N. (1926): *Leaves from a Viceroy's Notebook and other Papers*. London.
- DECKER, K.D. (1992): *Languages of Chitral*. Islamabad. (= Sociolinguistic Survey of Northern Pakistan 5) .
- DECKER, K.D. (1996): Some Observations on Language Vitality in Chitral. In: BASHIR, E. & ISRAR-UD-DIN (Eds.): *Proceedings of the Second International Hindukush Cultural Conference*. Karachi. (= Hindukush and Karakorum Studies 1), 159-166.
- DEMSETZ, H. (1967): *Toward a Theory of Property Rights*. In: *American Economic Review. Papers and Proceedings* 57(2), 347-359.
- DENHOLM, J. & N.S. JODHA (1992): *Agroforestry as an Option for Mountain Agricultural Development*. In: JODHA, N.S., M. BANSKOTA & T. PARTAB (Eds.): *Sustainable Mountain Agriculture: Perspectives and Issues*. Vol. 2. New Delhi. 773-790.
- DENKER, D. (1981): *Pakistan's Kalash: People of Fire and Fervor*. In: *National Geographic Magazine* 160(4), 458-473.
- DFID (Department for International Development) (1999): *Sustainable Livelihoods Guidance Sheets*. London.
- DICHTER, D. (1967): *The North West Frontier of Pakistan. A Study in Regional Geography*. London.
- DIETZ, T., E. OSTROM & P.C. STERN (2003): *The Struggle to Govern the Commons*. In: *Science* 302, 1907-1912.
- DIETZ, T., N. DOŁŠAK, E. OSTROM & P.C. STERN (2002): *The Drama of the Commons*. In: *National Research Council (Eds.): The Drama of the Commons: Committee on the Human Dimension of Global Change*. Washington.
- DIKAU, R., H. KREUTZMANN & M. WINIGER (2002): *Zwischen Alpen, Anden und Himalaya*. In: EHLERS, E & H. LESER (Eds.): *Geographie heute – für die Welt von morgen*. Gotha 82-89.
- DITTMANN, A. (1994): *Bazare im Karakorum? – Zur Übertragbarkeit des Begriffs „Bazar“ auf die Geschäftszentren in den Northern Areas von Pakistan*. In: *Petermanns Geographische Mitteilungen* 138(6), 325-335.
- DITTMANN, A. (1997): *Central Goods and Ethno-Linguistic Groups in the Bazaars of Northern Pakistan: An Example of Central Place Theory Modifications in Mountainous Environment*. In: STELLRECHT, I. & M. WINIGER (Eds.): *Perspectives on History and Change in the Karakorum, Hindukush, and Himalaya*. Köln. (= Culture Area Karakorum Scientific Studies 3), 119-133.
- DITTMANN, A., FAZLUR-RAHMAN & A. HOLDSCHLAG (2000): *Chitral – Urban Development and Traditional Bazaar Structure*. In: DITTMANN, A. (Ed.): *Mountain Societies in Transition. Contributions to the Cultural Geography of the Karakorum*. Köln (= Culture Area Karakorum Scientific Studies 6), 257-270.

- DITTMANN, A. & M. NÜSSER (2002): Siedlungsentwicklung im östlichen Hindukush: Das Beispiel Chitral Town (North West Frontier Province, Pakistan). In: *Erdkunde* 56(1), 60-71.
- DITTRICH, C. (1997): Food Security and Vulnerability to Food Crises in the Northern Areas of Pakistan. In: STELLRECHT, I. & M. WINIGER (Eds.): *Perspectives on History and Change in the Karakorum, Hindukush, and Himalaya*. Köln. (= Culture Area Karakorum Scientific Studies 3), 23-42.
- DITTRICH, C. (1998): High Mountain Food System in Transition – Food Security, Social Vulnerability and Development in Northern Pakistan. In: STELLRECHT, I. & H.-G. BOHLE (Eds.): *Transformation of Social and Economic Relationships in Northern Pakistan*. Köln. (= Culture Area Karakorum Scientific Studies 5), 231-354.
- DUFFIELD, C., J.S. GARDNER, F. BERKES & R.B. SINGH (1998): Local Knowledge in the Assessment of Resource Sustainability: Case Studies in Himachal Pradesh, India and British Columbia, Canada. In: *Mountain Research and Development* 18(1), 35-49.
- DU, Z. (1998): A Comparative Study on the Altitudinal Belts in the Karakorum Mountains. In: STELLRECHT, I. (Ed.): *Karakorum-Hindukush-Himalaya: Dynamics of Change*. Köln. (= Culture Area Karakorum Scientific Studies 4/I), 127-144.
- DURAND, A. (1899): *The Making of a Frontier. Five Years Experiences and Adventures in Gilgit, Hunza, Nager, Chitral and Eastern Hindu Kush*. London. (Reprint Graz 1974)
- ECKHOLM, E.P. (1975): The Deterioration of Mountain Environments. In: *Science* 189, 764-770.
- EGGERT, P. (1990): *Die frühere Sozialordnung Moolkhos und Turkhos (Chitral)*. Stuttgart. (= Beiträge zur Südasien Forschung 134).
- EHLERS, E. (1995): Die Organisation von Raum und Zeit – Bevölkerungswachstum, Ressourcenmanagement und angepasste Landnutzung im Bagrot/Karakorum. In: *Petermanns Geographische Mitteilungen* 139(2), 105-120.
- EHLERS, E. (1996): Population Growth, Resource Management, and Well-Adapted Land Use in the Bagrot/Karakoram. In: *Applied Geography and Development* 48, 7-28.
- EHLERS, E. (1997): Traditional Environmental Knowledge and Consciousness and the Problem of Sustained Agricultural Development. In: *Applied Geography and Development* 49, 79-95.
- EHLERS, E. (2000a): Pastoralism in the Bagrot: Spatial Organization and Economic Diversity. In: EHLERS, E. & H. KREUTZMANN (Eds.): *High Mountain Pastoralism in Northern Pakistan*. Stuttgart. (= Erdkundliches Wissen 132), 73-87.
- EHLERS, E. (2000b): Sustainability – Indigenous Knowledge Systems and Traditional Land Uses. The Northern Areas of Pakistan as an Example. In: DITTMANN, A. (Ed.): *Mountain Societies in Transition. Contributions to the Cultural Geography of the Karakorum*. Köln. (= Culture Area Karakorum Scientific Studies 6), 37-63.

- EHLERS, E. & H. KREUTZMANN (Eds.) (2000a): High Mountain Pastoralism in Northern Pakistan. Stuttgart. (= Erdkundliches Wissen 132).
- EHLERS, E. & H. KREUTZMANN (2000b): High Mountain Ecology and Economy: Potential and Constraints. In: EHLERS, E. & H. KREUTZMANN (Eds.): High Mountain Pastoralism in Northern Pakistan. Stuttgart. (= Erdkundliches Wissen 132), 9-36.
- ENGLISH, P.W. (1973): Geographical Perspectives on the Middle East: The Passing of the Ecological Trilogy. In: MIKESSELL, M.W. (Ed.): Geographers Abroad. Essays on the Problems and Prospects of Research in Foreign Areas. Chicago. (= The University of Chicago Department of Geography Research Paper No. 152), 134-164.
- FAIZI, I. (1996a): The Future of Chitrali Culture and Literature. In: BASHIR, E. & ISRAR-UD-DIN (Eds.): Proceedings of the Second International Hindukush Cultural Conference. Karachi. (= Hindukush and Karakorum Studies 1), 447-451.
- FAIZI, I. (1996b): Wakhan: A Window into Central Asia. Islamabad.
- FAIZI, I. (1999): Indigenous Resource Management in Chitral. Unpublished Report, IUCN Chitral, Pakistan.
- FAIZI, I. (n.d): Cultural Background of Shu. A Manuscript Report of the Shubinak (Weavers) Office, Chitral.
- FAZLUR-RAHMAN (1998): Growth, Development and Functional Diversification of Settlements in the Northern Areas of Pakistan. A Study of Astor Valley. Unpublished M.Phil. Thesis Submitted to the University of Peshawar, Pakistan.
- FAZLUR-RAHMAN (2000): Community Organizations and Management of Natural Resources in the Northern Areas of Pakistan: A Study of Astor Valley. In: DITTMANN, A. (Ed.): Mountain Societies in Transition. Contributions to the Cultural Geography of the Karakorum. Köln. (= Culture Area Karakorum Scientific Studies 6), 65-85.
- FEENY, D., F. BERKES, B.J. MCCAY & J.M. ACHESON (1990): The Tragedy of the Commons: Twenty-two Years Later. In: Human Ecology 18(1), 1-19.
- FELMY, S. (1997): The Voice of the Nightingale. A Personal Account of the Wakhi Culture in Hunza. Oxford University Press.
- FISCHER, R. (1998): The History of Settlement in Puniyal, Northern Areas of Pakistan in the Nineteenth and Twentieth Centuries. In: STELLRECHT, I. (Ed.): Karakorum-Hindukush-Himalaya: Dynamics of Change. Köln. (= Culture Area Karakorum Scientific Studies 4/1), 511-526.
- FISCHER, R. (2000a): Coming Down from the Mountain Pastures: Decline of High Pasturing and Changing Patterns of Pastoralism in Puniyal. In: EHLERS, E. & H. KREUTZMANN (Eds.): High Mountain Pastoralism in Northern Pakistan. Stuttgart. (= Erdkundliches Wissen 132), 59-71.
- FISCHER, R. (2000b): Village – Valley – Nation. Integrating Mountain Communities into a Nation State. In: DITTMANN, A. (Ed.): Mountain Societies in Transition. Contributions to the Cultural Geography of the Karakorum. Köln. (= Culture Area Karakorum Scientific Studies 6), 87-102.

- FORMAN, S.H. (1988): The Future Value of "Verticality" Concept: Implications and Possible Applications in the Andes. In: ALLAN, N.J.R., G.W. KNAPP & C. STADEL (Eds.): *Human Impact on Mountains*. Totowa, New Jersey. 133-153.
- FREUDENBERGER, M.S., J.A. CARNEY & A.R. LEBBIE (1997): Resiliency and Change in Common Property Regimes in West Africa: The Case of the Tongo in The Gambia, Guinea and Sierra Leone. In: *Society and Natural Resources* 10(4), 383-402.
- FRICKE, T. (1989): Introduction: Human Ecology in the Himalaya. In: *Human Ecology* 17(2), 131-145.
- FUNNELL, D. & M.F. PRICE (2003): Mountain Geography: A Review. In: *The Geographical Journal* 169(3), 183-190.
- FUNNELL, D. & R. PARISH (2001): *Mountain Environment and Communities*. Routledge, London.
- FÜRER-HAIMENDORF, C., von. (1971): Comparisons Between the Mountain Peoples of the Philippines and Some Tribes of North-East India. In: *Geographical Journal* 137(3), 339-348.
- GADGIL, M. & F. BERKES (1991): Traditional Resource Management Systems. In: *Resource Management and Optimisation* 8(3/4), 127-141.
- GADGIL, M., F. BERKES & C. FOLKE (1993): Indigenous Knowledge for Biodiversity Conservation. In: *Ambio* 22(2/3), 151-156.
- GADGIL, M. & P. IYER (1989): On the Diversification of Common-property Resource Use by Indian Society. In: BERKES, F. (Ed.): *Common Property Resources: Ecology and Community-based Sustainable Development*. London. 40-255.
- GANJANAPAN, A. (1998): The Politics of Conservation and the Complexity of Local Control of Forest in the Northern Thai Highlands. In: *Mountain Research and Development* 18(1), 71-82.
- GENERAL STAFF INDIA (1928): *Military Report and Gazetteer on Chitral*. 2<sup>nd</sup> Edition. Government of India Press Calcutta. [L/MIL/17/13/57]
- GIBBS, C.J.N. & D.W. BROMLEY (1989): Institutional Arrangements for Management of Rural Resources: Common-property Regimes. In: BERKES, F. (Ed.): *Common Property Resources: Ecology and Community-based Sustainable Development*. London. 22-32.
- GILLES, J.L., A. HAMMOUDI & M. MAHDI (1992): Oukaimedene, Morocco: A High Mountain Agdal. In: BROMLEY, D.W. (Ed.): *Making the Commons Work. Theory, Practice, and Policy*. California. 229-246.
- GIORDANO, M. (2003): The Geography of the Commons: The Role of Scale and Space. In: *Annals of the Association of American Geographers* 93(2), 365-375.
- GOHAR, A. (1994): Gaps Between Indigenous and Exogenous Knowledge in Agroforestry Development: A Case Study in Northern Areas Pakistan. Unpublished Master Thesis. International Institute for Aerospace Survey and Earth Sciences (= ITC) Enschede, The Netherlands.

- GOKHALE-CHATTERJI, S. (1994): Socio-economic Transition in Zangskar: A Development Strategy. In: CROOK, J. & H. OSMASTON (Eds.): *Himalayan Buddhist Villages: Environment, Resources, Society and Religious Life in Zangskar, Ladakh*. Bristol. 787-800.
- GOLDSTEIN, M.C. (1981): High-Altitude Tibetan Populations in the Remote Himalaya: Social Transformation and its Demographic, Economic and Ecological Consequences. In: *Mountain Research and Development* 1(1), 5-18.
- GONWFP (1988): *District Census of Rural Settlements in Chitral*. Vol. 2. Bureau of Statistics, Planning and Development Department, Government of North West Frontier Province.
- GONWFP (1997): *NWFP Development Statistics*. Bureau of Statistics, Planning, Environment & Development Department, PESHAWAR.
- GOP (1961): *Population Census Report of Tribal Areas*. Chitral State. Karachi.
- GOP (1976): *District Census Report of Chitral 1972*. Islamabad.
- GOP (1983): *District Census Report of Chitral 1981*. Islamabad.
- GOP (1999): *District Census Report of Chitral 1998*. Islamabad.
- GRIMA, A.P.L. & F. BERKES (1989): *Natural Resources: Access, Rights-to-use and Management*. In: BERKES, F. (Ed.): *Common Property Resources: Ecology and Community-based Sustainable Development*. London. 33-54.
- GRÖTZBACH, E. (1984): *Mobility of Labour in High Mountains and the Socio-economic Integration of Peripheral Areas*. In: *Mountain Research and Development* 4(3), 229-235.
- GRÖTZBACH, E. (1988): *High Mountains as Human Habitat*. In: ALLAN, N.J.R., G.W. KNAPP & C. STADEL (Eds.): *Human Impact on Mountains*. Totowa, New Jersey. 24-35.
- GRÖTZBACH, E. (1989): *Kaghan – Zur Entwicklung einer Peripheren Talschaft im Westhimalaya (Pakistan)*. In: HASERODT, K (Hg.): *Hochgebirgsräume Nordpakistans im Hindukusch, Karakorum und Westhimalaya. Beiträge zur Nature – und Kulturgeographie*. Berlin (=Beiträge und Materialien zur Regionalen Geographie 2), 1-18.
- GRÖTZBACH, E. & C. STADEL (1997): *Mountain Peoples and Cultures*. In: MESSERLI, B. & J.D. IVES (Eds.): *Mountains of the World. A Global Priority*. New York, London. 17-38.
- GUILLET, D. (1980): *Reciprocal Labour and Peripheral Capitalism in the Central Andes*. In: *Ethnology* 19(1), 151-167.
- GUILLET, D. (1981): *Agrarian Ecology and Peasant Production in the Central Andes*. In: *Mountain Research and Development* 1(1), 19-28.
- GUILLET, D. (1983): *Towards a Cultural Ecology of Mountains: The Central Andes and the Himalaya Compared*. In: *Current Anthropology* 24(5), 561-574.

- GUPTA, A.K. (1992): Farmer's Innovations and Agricultural Technologies. In: JODHA, N.S., M. BANSKOTA & T. PARTAB (Eds.): Sustainable Mountain Agriculture: Perspectives and Issues. Vol. 2. New Delhi. 393-412.
- GUPTA, A.K. & K. URA (1992): Indigenous Farming Technologies and Environment: Experiences in Bhutan. In: JODHA, N.S., M. BANSKOTA & T. PARTAB (Eds.): Sustainable Mountain Agriculture: Perspectives and Issues. Vol. 2. New Delhi. 539-568.
- GURDON, B.E.M. (1933): Chitral Memories: Events Leading up to the Siege. In: The Himalayan Journal 5, 1-27.
- GURDON, B.E.M. (1934): Chitral Memories: The Siege of Chitral. In: The Himalayan Journal 6, 1-30.
- GURDON, B.E.M. (1936): Early Explorers of Kafiristan. In: The Himalayan Journal 8, 25-43.
- GUTSCHOW, K. (1997): 'Lords of the Fort', 'Lords of the Water' and 'No Lords at All': The Politics of Irrigation in Three Tibetan Societies. In: OSMASTON, H. & N. TSERING (Eds.): Proceedings of the Sixth International Colloquium on Ladakh, Leh 1993. University of Bristol. (= Recent Research on Ladakh 6), 105-115.
- GUTSCHOW, K. (1998): Hydro-logic in the Northwest Himalaya: Several Case Studies from Zangskar. In: STELLRECHT, I. (Ed.): Karakorum-Hindukush-Himalayas: Dynamics of Change. Köln. (= Culture Area Karakorum Scientific Studies 4/I), 443-473.
- HAAGSMA, B. (1995): Traditional Water Management and State Intervention: The Case of Santo Antao, Cape Verde. In: Mountain Research and Development 15(1), 39-56.
- HALVORSON, S.J. (2002): Environmental Health Risks and Gender in the Karakoram-Himalaya, Northern Pakistan. In: The Geographical Review 92(2), 257-281.
- HALVORSON, S.J. (2003): Placing Health Risks in the Karakoram: Local Perception of Diseases, Dependency, and Social Change in Northern Pakistan. In: Mountain Research and Development 23(3), 271-277.
- HARDIN, G. (1968): The Tragedy of the Commons. In: Science 162, 1243-1249.
- HARRISON, J. (1998): A Brief Introduction to the Architecture of Kalash, Chitral. In: STELLRECHT, I. (Ed.): Karakorum-Hindukush-Himalaya: Dynamics of Change. Köln. (= Culture Area Karakorum Scientific Studies 4/I), 595-602.
- HASERODT, K. (1989a): Chitral (pakistanischer Hindukusch). Strukturen, Wandel und Probleme eines Lebensraumes im Hochgebirge zwischen Gletschern und Wüste. In: HASERODT, K (Hg.): Hochgebirgsräume Nordpakistans im Hindukusch, Karakorum und Westhimalaya. Beiträge zur Natur – und Kulturgeographie. Berlin. (= Beiträge und Materialien zur Regionalen Geographie 2), 43-180.
- HASERODT, K. (1989b): Zur pleistozänen und postglazialen Vergletscherung zwischen Hindukusch, Karakorum und Westhimalaya. In: HASERODT, K (Hg.): Hochgebirgsräume Nordpakistans im Hindukusch, Karakorum und Westhimalaya. Beiträge zur Natur – und Kulturgeographie. Berlin. (= Beiträge und Materialien zur Regionalen Geographie 2), 181-233.

- HASERODT, K. (1996): The Geographical Features and Problems of Chitral: A Short Introduction. In: BASHIR, E. & ISRAR-UD-DIN (Eds.): Proceedings of the Second International Hindukush Cultural Conference. Karachi. (= Hindukush and Karakorum Studies 1), 4-18.
- HASRAT, G.M.K. (1996): Some Ancient Customs of Chitral. . In: BASHIR, E. & ISRAR-UD-DIN (Eds.): Proceedings of the Second International Hindukush Cultural Conference. Karachi. (= Hindukush and Karakorum Studies 1), 181-192.
- HATLEY, T. & M. THOMPSON (1985): Rare Animals, Poor People, and Big Agencies: A Perspective on Biological Conservation and Rural Development in the Himalaya. In: Mountain Research and Development 5(4), 365-377.
- HERBERS, H. (1997): The Changing Position of Women in Northern Pakistan: From Agricultural Producers to Off-farm Employees. In: STELLRECHT, I. & M. WINIGER (Eds.): Perspectives on History and Change in the Karakorum, Hindukush, and Himalaya. Köln. (= Culture Area Karakorum Scientific Studies 3), 417-430.
- HERBERS, H. (1998): Arbeit und Ernährung in Yasin: Aspekte des Produktions-Reproduktions-Zusammenhangs in einem Hochgebirgstal Nordpakistans. Stuttgart. (= Erdkundliches Wissen 123).
- HERBERS, H. (2000a): Why are Mountain Farmers Vegetarians? Nutritional and Non-Nutritional Dimensions of Animal Husbandry in High Asia. In: EHLERS, E. & H. KREUTZMANN (Eds.): High Mountain Pastoralism in Northern Pakistan. Stuttgart. (= Erdkundliches Wissen 132), 189-209.
- HERBERS, H. (2000b): Undernutrition and Heavy Workload in Northern Pakistan – Consequences for Production and Reproduction. In: DITTMANN, A. (Ed.): Mountain Societies in Transition. Contributions to the Cultural Geography of the Karakorum. Köln. (= Culture Area Karakorum Scientific Studies 6), 103-130.
- HERBERS, H. & G. STÖBER (1995): Bergbäuerliche Viehhaltung in Yasin (Northern Areas, Pakistan): Organisatorische und rechtliche Aspekte der Hochweide-Nutzung. In: Petermann Geographische Mitteilungen 139(2), 87-104.
- HEWITT, F. (1989): Women's Work, Women's Place: The Gendered Life-World of a High Mountain Community in Northern Pakistan. In: Mountain Research and Development 9(4), 335-352.
- HEWITT, K. (1988): The Study of Mountain Lands and Peoples: A Critical Overview. In: ALLAN, N.J.R., G.W. KNAPP & C. STADEL (Eds.): Human Impact on Mountains. Totowa, New Jersey. 6-23.
- HEWITT, K. (1989): The Altitudinal Organisation of Karakoram Geomorphic Processes and Depositional Environments. In: DERBYSHIRE, E. & L. A. OWEN (Eds.): Zeitschrift für Geomorphologie Supplementband 76, 9-32.
- HEWITT, K. (1992): Mountain Hazards. In: Geo Journal 27(1), 47-60.
- HEWITT, K. (1997): Risks and Disasters in Mountain Lands. In: MESSERLI, B. & J.D. IVES (Eds.): Mountains of the World. A Global Priority. New York, London. 371-408.



- HOLDSCHLAG, A. (2000): Chitral: A Society between Irrigation, Isolation and Migration – Recent Observations from Lower Chitral and Torkho. In: DITTMANN, A. (Ed.): Mountain Societies in Transition. Contributions to the Cultural Geography of the Karakorum. Köln. (= Culture Area Karakorum Scientific Studies 6), 131-153.
- HOLDSCHLAG, A. (2003): Siedlungssysteme in Chitral. Unveröff. Abschlussbericht an die DFG.
- HUNT, R.C. & E. HUNT (1976): Canal Irrigation and Local Social Organization. In: Current Anthropology 17(3), 389-411. [including discussion].
- HUSAIN, T. (1992): The Aga Khan Rural Support Programme: An Approach to Village Management Systems in Northern Pakistan. In: JODHA, N.S., M. BANSKOTA & T. PARTAB (Eds.): Sustainable Mountain Agriculture: Perspectives and Issues. Vol. 2. New Delhi. 671-709.
- HUSSAM-UL-MULK (1974a): Kalash Mythology. In: JETTMAR, K. (Ed.): Cultures of the Hindukush. Selected Papers from the Hindukush Cultural Conference held at Moesgard in 1970. Wiesbaden. (= Beiträge zur Südasien Forschung 1), 81-83.
- HUSSAM-UL-MULK (1974b): Chitral Folklore. In: JETTMAR, K. (Ed.): Cultures of the Hindukush. Selected Papers from the Hindukush Cultural Conference held at Moesgard in 1970. Wiesbaden. (= Beiträge zur Südasien Forschung 1), 95-115.
- HUSSAM-UL-MULK & J. STALEY (1968): Houses in Chitral: Traditional Design and Function. In: Folklore 79, 92-110.
- IFAD (INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT) (1995): Common Property Resources and the Rural Poor in Sub-Saharan Africa. Rome. (= Special Programme for Sub-Saharan African Countries Affected by Drought and Desertification)
- INTELLIGENCE BRANCH, Division of the Chief of the Staff, Army Headquarters, India (1907): Frontier and Overseas Expeditions from India 1. Tribes North of the Kabul River. Simla.
- ISRAR-UD-DIN (1965): A Social Geography of Chitral State. Unpublished M.S. Thesis Submitted to the Department of Geography, King's College, University of London.
- ISRAR-UD-DIN (1966): Settlement Pattern and House-Types in Chitral State. In: Pakistan Geographical Review 21(2), 21-38.
- ISRAR-UD-DIN (1967): Socio-economic Developments in Chitral State. In: Pakistan Geographical Review 22(1), 42-51.
- ISRAR-UD-DIN (1969): The People of Chitral: A Survey of their Ethnic Diversity. In: Pakistan Geographical Review 24(1), 45-57.
- ISRAR-UD-DIN (1971): Population of Chitral: Growth Distribution and Socio-economic Structure. In: Pakistan Geographical Review 26(1), 38-49.
- ISRAR-UD-DIN (1979): Chitral – A Historical Sketch. In: Central Asia 3, 1-13.
- ISRAR-UD-DIN (1984): House Types and Structures in Chitral District. In: MILLER, K. J. (Ed.): The International Karakoram Project Vol. 1. London. 265-289.

- ISRAR-UD-DIN (1992a): Irrigation and Society in Chitral District: A Case Study of Khot Valley. In: *Pakistan Journal of Geography* 2 (1/2), 113-143.
- ISRAR-UD-DIN (1992b): Habitat in the Highlands of Pakistan. In: STELLRECHT, I. (Ed.): *Culture Area Karakorum Newsletter* 2. Tübingen. 24-25.
- ISRAR-UD-DIN (1995a): Habitat in the Highlands of Pakistan. A Study of the Yarkhun and Laspur Valleys of Chitral District. In: STELLRECHT, I. (Ed.): *Workshop on Problems of Comparative High Mountain Research with Regard to the Karakorum*. Tübingen. October 12-14 Tübingen (= *Culture Area Karakorum Occasional Papers* 2), 147-173.
- ISRAR-UD-DIN (1995b): Habitat in the Highlands of Pakistan: A Study of Ghizer Basin Northern Areas. In: MALIK, M.K. (Ed.): *Proceedings of the 6<sup>th</sup> All Pakistan Geographical Conference, Department of Geography Islamia University Bahawalpur*. 345-371.
- ISRAR-UD-DIN (1996): Irrigation and Society in Chitral District. In: BASHIR, E. & ISRAR-UD-DIN (Eds.): *Proceedings of the Second International Hindukush Cultural Conference*. Karachi. (= *Hindukush and Karakorum Studies* 1), 19-42.
- ISRAR-UD-DIN (2000): Social Organisation and Irrigation Systems in the Khot Valley, Eastern Hindukush. In: KREUTZMANN, H. (Ed.): *Sharing Water: Irrigation and Water Management in the Hindukush - Karakoram - Himalaya*. Karachi. 55-72.
- ITURRIZAGA, L. (1997): The Valley of Shimshal - A Geographical Portrait of a Remote High Mountain Settlement and its Pastures with Reference to Environmental Habitat Conditions in the North-West Karakorum (Pakistan). In: *GeoJournal* 42(2/3), 303-328.
- IVES, J.D. (1997): Comparative Inequalities – Mountain Communities and Mountain Families. In: MESSERLI, B. & J.D. IVES (Eds.): *Mountains of the World. A Global Priority*. New York, London. 61-84.
- IVES, J.D. (1998): The Himalayan Dilemma Reconsidered. In: STELLRECHT, I. (Ed.): *Karakorum-Hindukush-Himalayas: Dynamics of Change*. Köln. (= *Culture Area Karakorum Scientific Studies* 4/II), 93-108.
- IVES, J.D. & B. MESSERLI (1989): *The Himalayan Dilemma: Reconciling Development and Conservation*. Routledge, London and New York.
- IVES, J.D. & B. MESSERLI (1990): Progress in Theoretical and Applied Mountain Research, 1973-1989, and Major Future Needs. In: *Mountain Research and Development* 10(2), 101-127.
- IVES, J.D. & B. MESSERLI (2001): Perspektiven für die zukünftige Gebirgsforschung und Gebirgsentwicklung. In: *Geographische Rundschau* 53(12), 4-7.
- IVES, J.D., B. MESSERLI & R.E. RHOADES (1997): Agenda for Sustainable Mountain Development. In: MESSERLI, B. & J.D. IVES (Eds.): *Mountains of the World. A Global Priority*. New York, London. 455-466.
- JACOBSEN, J.P. (1998): Investigations into the Vertical Temperature and Precipitation Gradients in Two Test Areas in Northern Pakistan (Yasin & Bagrot). In: STELLRECHT,

- I. (Ed.): Karakorum-Hindukush-Himalaya: Dynamics of Change. Köln. (= Culture Area Karakorum Scientific Studies 4/I), 145-161.
- JANJUA, Z.J. (1998): Tradition and Change in the Darel and Tangir Valleys. In: STELLRECHT, I. (Ed.): Karakorum-Hindukush-Himalaya: Dynamics of Change. Köln. (= Culture Area Karakorum Scientific Studies 4/I), 415-427.
- JETTMAR, K. (Ed.) (1974): Cultures of the Hindukush. Selected Papers from the Hindukush Cultural Conference held at Moesgard in 1970. Wiesbaden. (= Beiträge zur Südasien Forschung 1)
- JODHA, N.S. (1986): Common Property Resources and Rural Poor in Dry Regions of India. *Environment and Political Weekly* 21(27), 1169-1181.
- JODHA, N.S. (1987): A Case Study of the Degradation of Common Property Resources in India. In: BLAIKIE, P. & H. BROOKFIELD (Eds.): *Land Degradation and Society*. London, Methuen. 196-207.
- JODHA, N.S. (1992): Mountain Perspective and Sustainability: A Framework for Development Strategies. In: JODHA, N.S., M. BANSKOTA & T. PARTAB (Eds.): *Sustainable Mountain Agriculture: Perspectives and Issues*. Vol. 1. New Delhi. 41-82.
- JODHA, N.S. (1997): Mountain Agriculture. In: MESSERLI, B. & J.D. IVES (Eds.): *Mountains of the World. A Global Priority*. New York, London. 313-335.
- JODHA, N.S. (2000a): Globalization and Fragile Mountain Environments: Policy Challenges and Choices. In: *Mountain Research and Development* 20(4), 296-299.
- JODHA, N.S. (2000b): Poverty Alleviation and Sustainable Development in Mountain Areas: Role of Highland-Lowland Links in the Context of Rapid Globalisation. In: BANSKOTA, M., T.S. PAPOLA & J. RICHTER (Eds.): *Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia*. Feldafing. Deutsche Stiftung für Internationale Entwicklung. 541-570.
- JODHA, N.S., M. BANSKOTA & T. PARTAB (1992): (Eds.): *Sustainable Mountain Agriculture: Perspectives and Issues*. 2 Vols. New Delhi.
- JOHNSON, K., E.A. OLSON & S. MANANDHAR (1982): Environmental Knowledge and Response to Natural Hazards in Mountainous Nepal. In: *Mountain Research and Development* (2), 175-188.
- KAMP, U. (1999): Jungquartäre Geomorphologie und Vergletscherung im östlichen Hindukusch, Chitral, Nordpakistan. (= Berliner Geographische Studien 50).
- KHAN, A.H., A. MAJID, M.H. HUSSEIN & E. J. VANDER VELDE (1994): Farmer-managed Irrigation Systems in Chitral. Colombo. (= International Irrigation Management Institute (IIMI) Working Paper 29).
- KHAN, H.W. & I.A. HUNZAI (2000): Bridging Institutional Gaps in Irrigation Management: The Post 'Ibex-Horn' Innovations in Northern Pakistan. In: KREUTZMANN, H. (Ed.): *Sharing Water: Irrigation and Water Management in the Hindukush - Karakoram - Himalaya*. Karachi. 133-145.

- KHAN, M. (1995): Participatory Approaches in Rural Development Planning in Pakistan. In: *Journal of Rural Development and Administration* 27(1), 152-162.
- KHATTAK, J.M. (1998): Community-based Conservation: Experiences from Pakistan. In: KOTHARI, A., N. PATHAK, R.V. ANURADHA & B. TANEJA (Eds.): *Communities and Conservation: Natural Resource Management in South and Central Asia*. New Delhi. 148-169.
- KIENHOLZ, H., H. HAFNER, G. SCHNEIDER & R. TAMRAKAR (1983): Mountain Hazard Mapping in Nepal's Middle Mountains with Maps of Land Use and Geomorphic Damages (Kathmandu-Kakani Area). In: *Mountain Research and Development* 3(3), 195-220.
- KOMOLL, A. & U. KAMP (1998): Bildung und ihre Auswirkungen auf Regionalentwicklung und Gesellschaft in Chitral, pakistanischer Hindukusch. In: *Die Erde* 129(4), 285-299.
- KOTHARI, A., R.V. ANURADHA & N. PATHAK (1998): Community-based Conservation: Issues and Prospects. In: KOTHARI, A., N. PATHAK, R.V. ANURADHA & B. TANEJA (Eds.): *Communities and Conservation: Natural Resource Management in South and Central Asia*. New Delhi. 25-57.
- KRENGEL, M. (1997): Migration and the Danger of Lost: Some Aspects of Cultural Identity in Kumaon/Indian Himalaya. In: STELLRECHT, I. & M. WINIGER (Eds.): *Perspectives on History and Change in the Karakorum, Hindukush, and Himalaya*. Köln. (= Culture Area Karakorum Scientific Studies 3), 171-188.
- KREUTZMANN, H. (1986): A Note on Yak-Keeping in Hunza (Northern Areas of Pakistan). In: *Production Pastorale et Société* 19, 99-106.
- KREUTZMANN, H. (1988): Oases of the Karakoram: Evolution of Irrigation and Social Organization in Hunza, North Pakistan. In: ALLAN, N.J.R., G.W. KNAPP & C. STADEL (Eds.): *Human Impact on Mountains*. Totowa, New Jersey. 243-254.
- KREUTZMANN, H. (1989): Hunza – Ländliche Entwicklung im Karakorum. Berlin. (=Abhandlungen Anthropogeographie Band 44)
- KREUTZMANN, H. (1991): The Karakoram Highway: Impact of Road Construction on Mountain Societies. In: *Modern Asian Studies* 25(4), 711-736.
- KREUTZMANN, H. (1992): Development Processes in the Hunza Valley, A Case Study from the Karakoram Mountains. In: *Pakistan Journal of Geography* 1(1/2), 1-17.
- KREUTZMANN, H. (1993a): Development Trends in the High Mountain Regions of the Indian Subcontinent: A Review. In: *Applied Geography and Development* 42, 39-59.
- KREUTZMANN, H. (1993b): Challenge and Response in the Karakoram: Socio-economic Transformation in Hunza, Northern Areas, Pakistan. In: *Mountain Research and Development* 13(1), 19-39.
- KREUTZMANN, H. (1994): Habitat Conditions and Settlement Processes in the Hindukush – Karakoram. In: *Petermanns Geographische Mitteilungen* 138(6), 337-356.

- KREUTZMANN, H. (1995a): Globalization, Spatial Integration and Sustainable Development in Northern Pakistan. In: *Mountain Research and Development* 15(3), 213-227.
- KREUTZMANN, H. (1995b): Communication and Cash Crop Production in the Karakorum: Exchange Relations under Transformation. In: STELLRECHT, I. (Ed.): *Workshop on Problems of Comparative High Mountain Research with Regard to the Karakorum*. Tübingen. October 12-14 Tübingen (= Culture Area Karakorum Occasional Papers 2), 100-117.
- KREUTZMANN, H. (1996a): Tourism in the Hindukush-Karakoram: A Case Study on the Valley of Hunza, (Northern Areas of Pakistan). In: BASHIR, E. & ISRAR-UD-DIN (Eds.): *Proceedings of the Second International Hindukush Cultural Conference*. Karachi. (= Hindukush and Karakorum Studies 1), 427-437.
- KREUTZMANN, H. (1996b): Ethnizität im Entwicklungsprozeß: Die Wakhi in Hochasien. Berlin.
- KREUTZMANN, H. (1998a): The Chitral Triangle: Rise and Decline of Trans-Montane Central Asian Trade, 1895-1935. *Asien Afrika Lateinamerika* 26, 289-327.
- KREUTZMANN, H. (1998b): From Water Towers of Mankind to Livelihood Strategies of Mountain Dwellers: Approaches and Perspectives for High Mountain Research. In: *Erdkunde* 52(3), 185-200.
- KREUTZMANN, H. (1998c): Trans-Montane Exchange Patterns Prior to the Karakoram Highway. In: STELLRECHT, I. (Ed.): *Karakorum-Hindukush-Himalaya: Dynamics of Change*. Köln. (= Culture Area Karakorum Scientific Studies 4/II), 21-43.
- KREUTZMANN, H. (1999): Rückzugsgebiet und Migration: Überlegungen zur Mobilität als Existenzsicherungsstrategie in Hochasien. In: JANEN, J. (Ed.): *Räumliche Mobilität und Existenzsicherung*. Berlin. (= *Abhandlungen Anthropogeographie*, 60), 83-104.
- KREUTZMANN, H. (2000a): Livestock Economy in Hunza: Societal Transformation and Pastoral Practices. In: EHLERS, E. & H. KREUTZMANN (Eds.): *High Mountain Pastoralism in Northern Pakistan*. Stuttgart. (= *Erdkundliches Wissen* 132), 89-120.
- KREUTZMANN, H. (2000b): Water Management in the Mountain Oases of the Karakoram. In: KREUTZMANN, H. (Ed.): *Sharing Water: Irrigation and Water Management in the Hindukush - Karakoram - Himalaya*. Karachi. 90-112.
- KREUTZMANN, H. (2000c): Water Towers of Humankind: Approaches and Perspectives for Research on Hydraulic Resources in the Mountain of South and Central Asia. In: KREUTZMANN, H. (Ed.): *Sharing Water: Irrigation and Water Management in the Hindukush - Karakoram - Himalaya*. Karachi. 13-31.
- KREUTZMANN, H. (Ed.) (2000d): *Sharing Water: Irrigation and Water Management in the Hindukush - Karakoram - Himalaya*. Karachi.
- KREUTZMANN, H. (2000e): Animal Husbandry in High Asia. Yak-Keeping at the Upper Pastoral Limits. In: MIEHE, G. & Z. YILI (Eds.): *Environmental Changes in High*

- Asia. Proceedings of an International Symposium at the University of Marburg. (= Marburger Geographische Schriften 135), 361-375.
- KREUTZMANN, H. (2000f): Improving Accessibility for Mountain Development: Role of Transport Networks and Urban settlements. In: BANSKOTA, M., T.S. PAPOLA & J. RICHTER (Eds.): Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia. Feldafing. Deutsche Stiftung für Internationale Entwicklung. 485-513.
- KREUTZMANN, H. (2001): Development Indicators for Mountain Regions. In: Mountain Research and Development 21(2), 132-139.
- KREUTZMANN, H. (2003): Ethnic Minorities and Marginality in the Pamirian Knot: Survival of Wakhi and Kirghiz in a Harsh Environment and Global Context. In: The Geographical Journal 169(3), 215-235.
- KRÜGER, F. (2003): Handlungsorientierte Entwicklungsforschung: Trends, Perspektiven, Defizite. In: Petermanns Geographische Mitteilungen 147(1), 6-15.
- KURIEN, J. (1995): Collective Action for Common Property Resource Rejuvenation: The Case of People's Artificial Reefs in Kerala State, India. In: Human Organization 54(2), 160-168.
- LENTZ, S. (2000): Rechtspluralismus in den Northern Areas/Pakistan. Köln. (= Culture Area Karakorum Scientific Studies, 9).
- LIBISZEWSKI, S. & G. BÄCHLER (1997): Conflicts in Mountain Areas – A Predicament for Sustainable Development. In: MESSERLI, B. & J.D. IVES (Eds.): Mountains of the World. A Global Priority. New York, London. 103-130.
- LOCKHART, W.S.A. & R.G. WOODTHORPE (1889): The Gilgit Mission, 1885-86. London.
- MACDONALD, K.I. (1996): Population Change in the Upper Braldu Valley, Baltistan, 1900-1990: All is Not as it Seems. In: Mountain Research and Development 16(4), 351-366.
- MACDONALD, K.I. (1998): Rationality, Representation, and the Risk Mediating Characteristics of a Karakoram Mountain Farming System. In: Human Ecology 26(2), 287-321.
- MACDONALD, K.I. & D. BUTZ (1998): Investigating Porter Relations as Locus for Transcultural Interaction in the Karakorum Region of Northern Pakistan. In: Mountain Research and Development 18(4), 333-343.
- MAHARAJAN, P.L., B. HADRA, P. ROY, R.P. YADAV & Z. RONGSU (1990): Environmental Diversity and its Influence on Farming Systems in the Hindukush - Himalayas. In: RILEY, K.W., N. MANTO, G.C. HAWTIN & R. YADAV (Eds.): Mountain Agriculture and Crop Genetic Resources. New Delhi. 9-42.
- MANIG, W. (Ed.) (1991): Sustainability and Changes in Rural Institutions in North Pakistan. Aachen (= Socio-economic Studies on Rural Development 85).
- MASOODUL MULK (1991): A Microcosm of Farming Strategies in Chitral. Gilgit. (= Aga Khan Rural Support Programme Occasional Paper 1).

- MASOODUL MULK (1992): Diversity of Farming Systems and Farmer's Strategies in the Mountain Valley of Chitral, Pakistan. In: JODHA, N.S., M. BANSKOTA & T. PARTAB (Eds.): Sustainable Mountain Agriculture: Perspectives and Issues. Vol. 2. New Delhi. 477-496.
- MATTHEW, R.A. (2001): Environmental Stress and Human Security in Northern Pakistan. In: Environmental Change and Security Project Report 7, 17-31.
- MCCAY, B.J. & S. JENTOFT (1998): Market or Community Failure? Critical Perspectives on Common Property Research. In: Human Organization 57(1), 21-29.
- MCGUIRE, R. & R. McC. NETTING (1982): Leveling Peasants? The Maintenance of Equity in a Swiss Alpine Community. In: American Ethnologist 9, 269-290.
- MCKEAN, M.A. (1992a): Management of Traditional Common Lands (Iriaichi) in Japan. In: BROMLEY, D.W. (Ed.): Making the Commons Work. Theory, Practice, and Policy. San Francisco, California. 63-98.
- MCKEAN, M.A. (1992b): Success on the Commons: A Comparative Examination of Institutions for Common Property Resource Management. In Journal of Theoretical Politics 4(3), 247-281.
- MCCNAIR, W.W. (1884): A visit to Kafirstan. In: Proceedings of the Royal Geographical Society 6, 1-18.
- MEILLASSOUX, C. (1983): The Economic Bases of Demographic Reproduction: From the Domestic Mode of Production to Wage-earning. In: The Journal of Peasant Studies 11(1), 50-61.
- MESSERSCHMIDT, D.A. (1981): Nogar and other Traditional Forms of Cooperation in Nepal: Significance for Development. In: Human Organization 40(1), 40-47.
- MESSERSCHMIDT, D.A. (1990): Indigenous Environmental Management and Adaptation: An Introduction to Four Case Studies From Nepal. In: Mountain Research and Development 10(1), 3-4.
- MEYER, C. (2000): Geschlechtsspezifische Wissensbestände und Interaktion: Frauen und sozialer Raum in Chitral/Nordpakistan. Unveröff. Abschlussbericht on die DFG.
- MIAN, N.I. (Ed.) (1986): Malakand Area Development Project: Agro-socio-economic Study of Chitral District. In: Institute for Development Studies N.W.F.P. Agricultural University Peshawar (Pakistan). [Study Conducted for International Fund for Agricultural Development (IFAD) Rome.] (= IDS Publications 192).
- MIEHE, G., M. WINIGER, J. BÖHNER & Z. YILI (2001): The Climatic Diagram Map of High Asia. In: Erdkunde 55(1), 94-97.
- MIEHE, S., T. CRAMER, J.P. JACOBSEN & M. WINIGER (1996): Humidity Conditions in the Western Karakorum as Indicated by Climatic Data and Corresponding Distribution Patterns of the Montane and Alpine Vegetation. In: Erdkunde 50(3), 190-204.
- MILLS, M.A. (1996): Winds of Change: Women's Traditional Work and Educational Development in Pakora, Ishkoman Tehsil. In: BASHIR, E. & ISRAR-UD-DIN (Eds.):

- Proceedings of the Second International Hindukush Cultural Conference. Karachi. (= Hindukush and Karakorum Studies 1), 417-426.
- MITCHELL, B. (1997): *Resource and Environmental Management*. Longmans.
- MONTGOMERIE, T. G. (1872): A Havildar's Journey through Chitral to Faizabad in 1870. In: *Journal of the Royal Geographical Society* 42, 180-201.
- MOORE, M.P. (1975): Co-operative Labour in Peasant Agriculture. In: *The Journal of Peasant Studies* 2(3), 270-291.
- MOUGHTIN, C. (1984): Barkulti in the Yasin Valley: A Study of Traditional Settlement Form as a Response to Environmental Hazard. In: MILLER, K.J. (Ed.): *The International Karakoram Project. Vol. 2*. Cambridge University Press, London. 307-322.
- MÜLLER-BÖKER, U. (1991): Knowledge and Evaluation of the Environment in Traditional Societies of Nepal. In: *Mountain Research and Development* 11(2), 101-114.
- MÜLLER-BÖKER, U. (1999): *The Chitawan Tharus in Southern Nepal: An Ethnological Approach*. Stuttgart. (= Nepal Research Centre Publication 21).
- MÜLLER-BÖKER, U. & M. KOLLMAIR (2000): Livelihood Strategies, and Local Perception of a New Nature Conservation Project in Nepal: The Kanchenjunge Conservation Area Project. In: *Mountain Research and Development* 20(4), 324-331.
- NASR-UL-MULK (1935): The Ismailis or Maulais of the Hindu Kush. In: *Journal of Central Asian Society* 22(4), 641-645.
- NATIONAL RESEARCH COUNCIL (Eds.) (2002): *The Drama of the Commons: Committee on the Human Dimension of Global Change*.
- NEGI, P.S. (1981): Impact of Money Order Economy on Socio-economic Development of Garhwal Region. In: *National Geographer* 16(1), 71-76.
- NETTING, R. (1974): *The System Nobody Knows: Village Irrigation in the Swiss Alps*. In: DOWNING, T.E. & M. GIBBSON (Eds.): *Irrigation's Impact on Society*. Tucson. (= *Anthropological Papers of the University of Arizona* 25), 67-75.
- NETTING, R. (1976): What Alpine Peasants have in Common: Observations on Communal Tenure in a Swiss Village. In: *Human Ecology* 4(2), 135-146.
- NETTING, R. (1997): Unequal Commoners and Uncommon Equity: Property and Community Among Smallholder Farmers. In: *The Ecologist* 27(1), 28-33.
- NING, W. (1997): Indigenous Knowledge and Sustainable Approaches for the Maintenance of Biodiversity in Nomadic Society: Experiences from the Eastern Tibetan Plateau. In: *Die Erde* 128(1), 67-80.
- NÜSSER, M. (1998a): *Nanga Parbat (NW- Himalaya): Naturräumliche Ressourcenausstattung und Humanökologische Gefügemuster der Landnutzung*. (= *Bonner Geographische Abhandlungen* 97).
- NÜSSER, M. (1998b): *Animal Husbandry and Fodder Requirements Around Nanga Parbat, Northern Areas, Pakistan: Recent and Historical Perspectives of Human-eco-*



- logical Relationships. In: STELLRECHT, I. (Ed.): *Karakorum-Hindukush-Himalaya: Dynamics of Change*. Köln. (= Culture Area Karakorum Scientific Studies 4/I), 319-337.
- NÜSSER, M. (1999): *Mobile Tierhaltung in Chitral: Hochweidennutzung und Existenzsicherung im pakistanischen Hindukusch*. In: JANEN, J. (Ed.): *Räumliche Mobilität und Existenzsicherung*. Berlin. (= *Abhandlungen Anthropogeographie*, 60), 105-131.
- NÜSSER, M. (2000a): *Change and Persistence: Contemporary Landscape Transformation in the Nanga Parbat Region, Northern Pakistan*. In: *Mountain Research and Development* 20(4), 348-355.
- NÜSSER, M. (2000b): *Recent Land Cover and Land Use Dynamics in the Nanga Parbat Area (N W Himalaya): Human-ecological Landscape Monitoring Using Repeat Photography*. In: MIEHE, G. & Z. YILI (Eds.): *Environmental Changes in High Asia. Proceedings of an International Symposium at the University of Marburg*. (= *Marburger Geographische Schriften* 135), 265-281.
- NÜSSER, M. (2001): *Understanding Cultural Landscape Transformation: A Re-photographic Survey in Chitral, Eastern Hindukush, Pakistan*. In: *Landscape and Urban Planning* 57, 241-255.
- NÜSSER, M. (2003): *Ressourcennutzung und Umweltveränderung: Mensch-Umwelt – Beziehungen in peripheren Gebirgsräumen*. In: MEUSEBURGER, P. & T. SCHWAN (Eds.): *Humanökologie: Ansätze zur Überwindung der Natur-Kultur-Dichotomie*. (= *Erdkundliches Wissen* 135), 327-342.
- NÜSSER, M. & J. CLEMENS (1996): *Impacts on Mixed Mountain Agriculture in the Rupal Valley, Nanga Parbat, Northern Pakistan*. In: *Mountain Research and Development* 16(2), 117-133.
- NÜSSER, M. & W. B. DICKORÉ (2002): *A Tangle in the Triangle: Vegetation Map of the Eastern Hindukush (Chitral, Northern Pakistan)*. In: *Erdkunde* 56(1), 37-59.
- OAKERSON, R.J. (1992): *Analyzing the Commons: A Framework*. In: BROMLEY, D.W. (Ed.): *Making the Commons Work. Theory, Practice, and Policy*. San Francisco, California. 41-59.
- ORLOVE, B.S. & D.W. GUILLET (1985): *Theoretical and Methodological Considerations on the Study of Mountain Peoples: Reflections on the Idea of Subsistence Type and the Role of History in Human Ecology*. In: *Mountain Research and Development* 5(1), 3-18.
- OSMASTON, H. (1994): *The Farming System*. In: CROOK, J. & H. OSMASTON (Eds.): *Himalayan Buddhist Villages: Environment, Resources, Society and Religious Life in Zangskar, Ladakh*. Bristol. 139-198.
- OSMASTON, H., J. FRAZER & S. CROOK (1994): *Human Adaptation to Environment in Zangskar*. In: CROOK, J. & H. OSMASTON (Eds.): *Himalayan Buddhist Villages: Environment, Resources, Society and Religious Life in Zangskar, Ladakh*. Bristol. 37-110.

- OSMASTON, H., R. FISHER; J. FRAZER & T. WILKINSON (1994): Animal Husbandry in Zangskar. In: CROOK, J. & H. OSMASTON (Eds.): *Himalayan Buddhist Villages: Environment, Resources, Society and Religious Life in Zangskar, Ladakh*. Bristol. 199-248.
- OSMASTON, H & J. CROOK (1994): Sha-de: Meagre Subsistence or Garden of Eden? In: CROOK, J. & H. OSMASTON (Eds.): *Himalayan Buddhist Villages: Environment, Resources, Society and Religious Life in Zangskar, Ladakh*. Bristol. 249-284.
- OSTROM, E. (1990): *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge.
- OSTROM, E. (1992): The Rudiments of a Theory of the Origins, Survival, and Performance of Common-property Institutions. In: BROMLEY, D.W. (Ed.): *Making the Commons Work. Theory, Practice, and Policy*. San Francisco, California. 293-318.
- OSTROM, E., J. BURGER, C.B. FIELD, R.B. NORGAARD & D. POLICANSKY (1999): Revisiting the Commons: Local Lessons, Global Challenges. In: *Science* 284, 278-282.
- OWEN, L.A. & E. DERBYSHIRE (1989): The Karakoram Glacial Depositional System. In: DERBYSHIRE, E. & L.A. OWEN (Eds.): *Zeitschrift für Geomorphologie Supplementband* 76, 33-73.
- PAFFEN, K.H., W. PILLEWIZER & H-J. SCHNEIDER (1956): *Forschung im Hunza-Karakorum. Vorläufiger Bericht über die wissenschaftlichen Arbeiten der Deutsche-Österreichischen Himalaya-Karakorum Expedition, 1954*. In: *Erdkunde* 10(1), 1-33.
- PARKES, P. (1987): Livestock Symbolism and Pastoral Ideology Among the Kafirs of the Hindukush. In: *Man* (N.S.) 22, 637-660.
- PARKES, P. (1992): Reciprocity and Redistribution in Kalasha Prestige Feasts. In: *Anthropozoologica* 16, 37-46.
- PARKES, P. (2001): The Kalasha of Pakistan: Problems of Minority Development and Environmental Management. In: <http://www.the-south-asian.com/june2001/Kalash1.htm> (last accessed August 2003)
- PEER, T. (2000): The Highland Steppes of the Hindukush Range as Indicators of Centuries Old Pasture Farming. In: MIEHE, G. & Z. YILI (Eds.): *Environmental Changes in High Asia. Proceedings of an International Symposium at the University of Marburg*. (= Marburger Geographische Schriften 135), 312-325.
- PESTALOZZI, H. (2000): Sectoral Fallow Systems and the Management of Soil Fertility: The Rationality of Indigenous Knowledge in the High Andes of Bolivia. In: *Mountain Research and Development* 20(1), 64-71.
- PILARDEAUX, B. (1997): Agrarian Transformation in Northern Pakistan and the Political Economy of Highland-Lowland Interaction. In: STELLRECHT, I. & M. WINIGER (Eds.): *Perspectives on History and Change in the Karakorum, Hindukush and Himalaya*. Köln. (= Culture Area Karakorum Scientific Studies 3), 43-57.

- PILARDEAUX, B. (1998): Surviving as a Mountain Peasant – Innovation, Development and Dynamic of Global Change in a High Mountain Region (Punial / Northern Pakistan). In: STELLRECHT, I. & H.-G. BOHLE (Eds.): Transformation of Social and Economic Relationships in Northern Pakistan. Köln. (= Culture Area Karakorum Scientific Studies 5), 355-424.
- PIMBERT, M. & J. PRETTY (1998): Diversity and Sustainability in Community-based Conservation. In: KOTHARI, A., N. PATHAK, R.V. ANURADHA & B. TANEJA (Eds.): Communities and Conservation: Natural Resource Management in South and Central Asia. New Delhi. 58-77.
- POLZER, C. (1998): The Breaking-up of Village Communities in the Context of Elections in Baltistan, Northern Areas, Pakistan. In: STELLRECHT, I. (Ed.): Karakorum-Hindukush-Himalayas: Dynamics of Change. Köln. (= Culture Area Karakorum Scientific Studies 4/II), 417-427.
- 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. Köln. (= Culture Area Karakorum Scientific Studies 6), 179-220.
- POTT, J. (1965): Houses in Chitral: West Pakistan. In: Architectural Association Journal 80, 245-249.
- PRESTON, D.A. & G.A. TAVERAS (1980): Changes in Land Tenure and Land Distribution as a Result of Rural Emigration in Highland Ecuador. In: Tijdschrift voor Economische Sociale Geografie 71(2), 98-107.
- PRETTY, J. (2003): Social Capital and the Collective Management of Resources. In: Science 302, 1912-1915.
- PRICE, M.F. & M. THOMPSON (1997): The Complex Life: Human Land Uses in Mountain Ecosystems. In: Global Ecology and Biogeography Letters 6(1), 77-90.
- PRICE, M.F. & R.G. BARRY (1997): Climate Change. In: MESSERLI, B. & J.D. IVES (Eds.): Mountains of the World. A Global Priority. New York, London. 409-445.
- RAHMAT, R.A.K. (1996): An Account of the Movement of sun and the Pleiades in Chitrali Tradition. In: BASHIR, E. & ISRAR-UD-DIN (Eds.): Proceedings of the Second International Hindukush Cultural Conference. Karachi. (= Hindukush and Karakorum Studies 1), 217-227.
- REIMERS, F. (1992): Untersuchungen zur Variabilität der Neiderschläge in den Hochgebirgen Nordpakistans und angrenzender Gebieten. Berlin. (= Beiträge und Materialien zur Regionalen Geographie 6).
- RENGER, J. & B. WOLFF (2000): Rent Seeking in Irrigated Agriculture: Institutional Problem Areas in Operation and Maintenance. Deutsche Gesellschaft für Zusammenarbeit (GTZ) Eschborn. (= MAINTAIN – Thematic Paper 9).
- RHOADES, R.E. (1990): Potatoes: Genetic Resources and Farmer Strategies: Comparison of the Peruvian Andes and Nepali Himalayas. In: RILEY, K.W., N. MANTO, G.C. HAWTIN & R. YADAV (Eds.): Mountain Agriculture and Crop Genetic Resources. New Delhi. 293-304.

- RHOADES, R.E. (1992): Thinking Globally Acting Locally: Technology for Sustainable Mountain Agriculture. In: JODHA, N.S., M. BANSKOTA & T. PARTAB (Eds.): Sustainable Mountain Agriculture: Perspectives and Issues. Vol. 1. New Delhi. 253-272.
- RHOADES, R.E. & S.I. THOMPSON (1975): Adaptive Strategies in Alpine Environments: Beyond Ecological Particularism. In: *American Ethnologist* 2(3), 535-551.
- RIECK A. (1997): From Mountain Refuge to "Model Area": Transformation of Shi'i Communities in Northern Pakistan. In: STELLRECHT, I. & M. WINIGER (Eds.): Perspectives on History and Change in the Karakorum, Hindukush and Himalaya. Köln. (= Culture Area Karakorum Scientific Studies 3), 215-231.
- RIEDER, P. & J. WYDER (1997): Economic and Political Framework for Sustainability of Mountain Areas. In: MESSERLI, B. & J.D. IVES (Eds.): Mountains of the World. A Global Priority. New York, London. 85-102.
- ROBERTS, R.S. & J. EMEL (1992): Uneven Development and the Tragedy of Commons: Competing Images for Nature-society Analysis. In: *Economic Geography* 68(3), 249-271.
- ROBERTSON, G.S. (1896): The Kafirs of the Hindu-Kush. London. [Reprinted 1974 Graz]
- ROBERTSON, G.S. (1898): Chitral: The Story of a Minor Siege. London. [Reprinted 1977 Oxford University Press Karachi]
- ROOHI, T. & L. JERABKOVA (1997): People Resources and Sustainability. A Study of Resource Management in Baltistan, Pakistan. Unpublished Master Thesis, Agricultural University of Norway.
- RUNGE, C.F. (1992): Common Property and Collective Action in Economic Development. In: BROMLEY, D.W. (Ed.): Making the Commons Work. Theory, Practice, and Policy. San Francisco, California. 17-39.
- SAID, M. (1991): Natural Hazards of the Hunza Valley. In: *Pakistan Journal of Geography* 1(1/2), 45-52.
- SAID, M. (1995): Natural Hazards of Hunza and Astor Valleys. In: STELLRECHT, I. (Ed.): Workshop on Problems of Comparative High Mountain Research with Regard to the Karakorum. Tübingen. October 12-14 Tübingen (= Culture Area Karakorum Occasional Papers 2), 33-43.
- SAID, M. (1998): Natural Hazards of Shigar Valley. In: STELLRECHT, I. (Ed.): Karakorum-Hindukush-Himalaya: Dynamics of Change. Köln. (= Culture Area Karakorum Scientific Studies 4/II), 251-268.
- SANWAL, M. (1989): What we Know About Mountain Development: Common Property, Investment Priorities and Institutional Arrangements. In: *Mountain Research and Development* 9(1), 3-14.
- SARMIENTO, F.O. (2000): Breaking Mountain Paradigms: Ecological Effects on Human Impacts in Man-aged Tropandean landscapes. In: *Ambio* 29(7), 423-431.

- SARMIENTO, F.O. (2002): Anthropogenic Changes in the Landscapes of Highland Ecuador. In: *The Geographical Review* 92(2), 213-234.
- SARMIENTO, L., M. MONASTERIO & M. MONTILLA (1993): Ecological Bases, Sustainability and Current Trends in Traditional Agriculture in the Venezuelan High Andes. In: *Mountain Research and Development* 13(2), 167-176.
- SAUNDERS, F. (1983): Karakoram Villages: An Agrarian Study of 22 Villages in the Hunza Ishkoman and Yasin Valleys of Gilgit District: FAO Integrated Rural Development Project PAK 80/009. Gilgit.
- SCHLAGER, E. & E. OSTROM, (1992): Property-rights Regimes and Natural Resources: A Conceptual Analysis. In: *Land Economics* 68(3), 249-262.
- SCHMIDT, M.E. (2000a): Pastoral Systems in Shigar/Baltistan: Communal Herding Management and Pasturage Rights. In: EHLERS, E. & H. KREUTZMANN (Eds.): *High Mountain Pastoralism in Northern Pakistan*. Stuttgart. (= *Erdkundliches Wissen* 132), 121-150.
- SCHMIDT, M.E. (2000b): Wasser- und Bodenrecht in Shigar (Baltistan). Unveröff. Abschlussbericht on die DFG.
- SCHMIDT, M.E. (2001): Wasser- und Bodenrecht in Shigar, Baltistan: Autochthone Institutionen der Ressourcennutzung im Zentralen Karakorum. Ph.D. Dissertation Submitted to the Institute of Geography, University of Bonn.
- SCHOMBERG, R.C.F. (1934): The Yarkhun Valley of Upper Chitral. In: *The Scottish Geographical Magazine* 50(4), 209-212.
- SCHOMBERG, R.C.F. (1936): Mountains of North Western Chitral. In: *Alpine Journal* 48, 302-310.
- SCHOMBERG, R.C.F. (1938): Kafirs and Glaciers. *Travels in Chitral*. London.
- SCHROEDER, R.F. (1985): Himalayan Subsistence Systems: Indigenous Agriculture in Rural Nepal. In: *Mountain Research and Development* 5(1), 31-44.
- SCHWEIZER, G. (1982): The Changing Structure of Mountain Farming in the Pontus Mountains (Eastern Black Sea Region, Turkey). In: *Applied Geography and Development* 20, 46-62.
- SCOTT, C.A. & M.F. WALTER (1993): Local Knowledge and Conventional Soil Science Approaches to Erosional Processes in the Shivalik Himalaya. In: *Mountain Research and Development* 13(1), 61-72.
- SEELAND, K. (1997): Indigenous Knowledge of Trees and Forests in Non-European Societies. In: SEELAND, K. (Ed.): *Nature is Culture: Indigenous Knowledge and Socio-cultural Aspects of Trees and Forests in Non-European Cultures*. London. (= Intermediate Technology Publications), 101-112.
- SHAH, M.K. (1991): Irrigation Organization and Management. In: MANIG, W. (Ed.): *Sustainability and Changes in Rural Institutions, in North Pakistan*. Aachen (= *Socio-economic Studies on Rural Development* 85), 141-153.

- SHAH, W.A. (1974): Notes on Kalash Folklore. In: JETTMAR, K. (Ed.): Cultures of the Hindukush. Selected Papers from the Hindukush Cultural Conference held at Moesgard in 1970. Wiesbaden. (= Beiträge zur Südasien Forschung 1). 69-80.
- SHAH, W.A. (1983): The Roshte, a Tribe of Chitral. In: SNOY, P. (Ed.): Ethnologie und Geschichte, Festschrift für Karl Jettmar. Wiesbaden. (= Beiträge zur Südasien Forschung 86), 639-648.
- SHARMA, P. & M. BANSKOTA (1992): Population Dynamics and Sustainable Agricultural Development in Mountain Areas. In: JODHA, N.S., M. BANSKOTA & T. PARTAB (Eds.): Sustainable Mountain Agriculture: Perspectives and Issues. Vol. 1. New Delhi. 165-184.
- SHARMA, S. & N.S. JODHA (1992): Mountain Farmer's Response to Development Efforts: Comparative Perspectives from the Countries of the Hindukush-Himalayan Region. In: JODHA, N.S., M. BANSKOTA & T. PARTAB (Eds.): Sustainable Mountain Agriculture: Perspectives and Issues. Vol. 1. New Delhi. 129-140.
- SHRESTHA, B. (1998): Involving Local Communities in Conservation. The Case of Nepal. In: KOTHARI, A., N. PATHAK, R.V. ANURADHA & B. TANEJA (Eds.): Communities and Conservation: Natural Resource Management in South and Central Asia. New Delhi. 130-147.
- SINGH, T. (1917): Assessment Report of Gilgit Tahsil, Lahore.
- SINGH, T.V. & J. KAUR (Eds.) (1985): Integrated Mountain Development. New Delhi.
- SINGLETON, S. & M. TAYLOR (1992): Common Property, Collective Action and Community. In: Journal of Theoretical Politics 4(3), 309-324.
- SKELDON, R. (1985): Population Pressure, Mobility, and Socio-economic Change in Mountain Environments: Regions of Refuge in Comparative Perspective. In: Mountain Research and Development 5(3), 233-250.
- SMETHURST, D. (2000): Mountain Geography. In: The Geographical Review 90(1), 35-56.
- SNOY, P. (1993): Alpwirtschaft im Hindukusch und Karakorum. In: SCHWEINFURTH, U. (Ed.): Neue Forschungen im Himalaya. (= Erdkundliches Wissen 112), 49-73.
- SOFFER, A. (1982): Mountain Geography – A New Approach. In: Mountain Research and Development 2(4), 391-398.
- SÖKEFELD, M. (1997): Ein Labyrinth von Identitäten in Nordpakistan. Zwischen Landbesitz, Religion und Kaschmir-Konflikt. Köln. (= Culture Area Karakorum Scientific Studies 8)
- SPERBER, B.G. (1996): Kalash: Dress and Textile Techniques. In: BASHIR, E. & ISRAR-UD-DIN (Eds.): Proceedings of the Second International Hindukush Cultural Conference. Karachi. (= Hindukush and Karakorum Studies 1), 377-407.
- STALEY, J. (1969): Economy and Society in the High Mountains of Northern Pakistan. In: Modern Asian Studies 3(3), 225-243.

- STEIN, A. (1921): *Serindia: Detailed Report of Exploration in Central Asia and Westernmost China*. Vol. 1. Text. Oxford.
- STELLRECHT, I. (Ed.) (1980): *Material zur Ethnographie Dardistans (Pakistan)*. Aus den nachgelassenen Aufzeichnungen von D.L.R. Lorimer. Personal Records from the India Office Library & Records. Teil 2/3: Gilgit & Yasin. Graz. (= *Bergvölker im Hindukusch und Karakorum* 3).
- STELLRECHT, I. (1997): *Dynamics of Highland-Lowland Interaction in Northern Pakistan since the 19<sup>th</sup> Century*. In: STELLRECHT, I. & M. WINIGER (Eds.): *Perspectives on History and Change in the Karakorum, Hindukush, and Himalaya*. Köln. (= *Culture Area Karakorum Scientific Studies* 5), 3-22.
- STELLRECHT, I. (1998a): *Trade and Politics – The High-Mountain Region of Pakistan in the 19<sup>th</sup> and 20<sup>th</sup> Century*. In: STELLRECHT, I & H.-G. BOHLE (Eds.): *Transformation of Social and Economic Relationships in Northern Pakistan*. Köln. (= *Culture Area Karakorum Scientific Studies* 5), 3-92.
- STELLRECHT, I. (1998b) (Ed.): *Karakorum – Hindukush – Himalayas: Dynamics of Change*. Köln. (= *Culture Area Karakorum Scientific Studies* 4/I & II).
- STELLRECHT, I. & M. WINIGER (Eds.) (1997): *Perspectives on History and Change in the Karakorum, Hindukush and Himalaya*. Köln. (= *Culture Area Karakorum Scientific Studies* 3).
- STEVENS, S.F. (1993): *Claiming the High Ground: Sherpas, Subsistence, and Environmental Change in the Highest Himalaya*. California.
- STÖBER, G. (2000a): *Irrigation Practice in Yasin, Northern Areas of Pakistan*. In: KREUTZMANN, H. (Ed.): *Sharing Water: Irrigation and Water Management in the Hindukush - Karakoram - Himalaya*. Karachi. 73-89.
- STÖBER, G. (2000b): *Structural Change and Domestic Agriculture in Yasin*. In: DITTMANN, A. (Ed.): *Mountain Societies in Transition. Contributions to the Cultural Geography of the Karakorum*. Köln. (= *Culture Area Karakorum Scientific Studies* 6), 103-130.
- STÖBER, G. (2001): *Zur Transformation Bäuerlicher Hauswirtschaft in Yasin (Northern Areas, Pakistan)* Bonn. (= *Bonner Geographische Abhandlungen* 105).
- STÖBER, G. & H. HERBERS (2000): *Animal Husbandry in Domestic Economies: Organization, Legal Aspects and Present Changes of Combined Mountain Agriculture in Yasin*. In: EHLERS, E. & H. KREUTZMANN (Eds.): *High Mountain Pastoralism in Northern Pakistan*. Stuttgart. (= *Erdkundliches Wissen* 132), 37-58.
- STONE G.D; R. McC NETTING & M.P. STONE (1990): *Seasonality, Labour Scheduling, and Agricultural Intensification in the Nigerian Savanna*. In: *American Anthropologist* 92(1), 7-23.
- STONE, P.B. (Ed.) (1992): *The State of the World's Mountains. A Global Report*. London, New Jersey.
- STREEFLAND, P.H., S.H. KHAN & O.V. LIESHOUT (1995): *A Contextual Study of the Northern Areas and Chitral*. AKRSP, Gilgit.

- SUTTHI, C. (1990): Mountain and Upland Agriculture: Genetic Resources in Thailand. In: RILEY, K.W., N. MANTO, G.C. HAWTIN & R. YADAV (Eds.): Mountain Agriculture and Crop Genetic Resources. New Delhi. 201-216.
- THE DAILY MASHRIQ, PESHAWAR (Urdu daily). May 12, 2000.
- THE ECOLOGIST (1992): The Commons: Where the Community has Authority. In: The Ecologist 22(4), 123-130.
- THOMAS, R.B. (1979): Effects of Change on High Mountain Adaptive Patterns. In: WEBBER, P.J. (Ed.): High Altitude Geocology. Boulder, Colorado. (= American Association for the Advancement of Science (AAAS) Selected Symposium 12), 139-188.
- THOMPSON, M. & M. WARBURTON (1985a): Uncertainty on a Himalayan Scale. In: Mountain Research and Development 5(2), 115-135.
- THOMPSON, M. & M. WARBURTON (1985b): Knowing where to hit it: A Conceptual Framework for the Sustainable Development of the Himalaya. In: Mountain Research and Development 5(3), 203-220.
- THRUPP, L.A. (1989): Legitimizing Local Knowledge: "Scientizd Packages" or Empowerment for Third World People. In: WARREN, D.M., L.J. SLIKKERVEER & S.O. TITILOLA (Eds.): Indigenous Knowledge Systems: Implications for Agriculture and International Development. Iowa State University Research Foundation. (= Studies in Technology and Social Change Series 11), 138-153.
- TITILOLA, S.O. (1990): The Economics of Incorporating Indigenous Knowledge Systems into Agricultural Development: A Model and Analytical Framework. Iowa State University Research Foundation. (= Studies in Technology and Social Change 17)
- TRÖGER, S. (2002): Sustainability in the Context of Natural and Social Environments: An Actor-oriented Interpretation from South-west Tanzania. In: Erdkunde 56(2), 170-183.
- TRÖGER, S. (2003): Akteure in ihrer Lebensgestaltung (*livelihood*) zu Zeiten sozialer Transformation: Theoretische Überlegungen und ihre Anwendung auf das Beispiel von Landnutzungskonflikten in Tansania. In: Geographica Helvetica 58(1), 24-34.
- TROLL, C. (1988): Comparative Geography of High Mountains of the World in the View of Landscape Ecology: A Development of three and a half Decades of Research and Organization. In: ALLAN, N.J.R., G.W. KNAPP & C. STADEL (Eds.): Human Impact on Mountains. Totowa, New Jersey. 36-56.
- UHLIG, H. (1978): Geocological Controls on High Altitude Rice Cultivation in the Himalayas and Mountain Regions of Southeast Asia. In: Arctic & Alpine Research 10(2), 519-529.
- UHLIG, H. (1995): Persistence and Change in High Mountain Agricultural Systems. In: Mountain Research and Development 15(3), 199-212.
- VANDER VELDE, E.J. (1990): Irrigation Management in Pakistan's Mountain Environments. International Centre for Integrated Mountain Development (= ICIMOD) Kathmandu, Nepal. (=Mountain Farming Discussion Paper 20).



- VANDER VELDE, E.J. (1992): Farmer-managed Irrigation Systems in the Mountains of Pakistan. In: JODHA, N.S., M. BANSKOTA & T. PARTAB (Eds.): Sustainable Mountain Agriculture: Perspectives and Issues. Vol. 2. New Delhi. 569-587.
- WADE, R. (1987a): The Management of Common Property Resources: Finding a Co-operative Solution. In: *Research Observer* 2(2), 219-234.
- WADE, R. (1987b): The Management of Common Property Resources: Collective Action As an Alternative to Privatisation or State Regulation. In: *Cambridge Journal of Economics* 11(2), 95-106.
- WADE, R. (1992): Common-property Resource Management in South Indian Villages. In: BROMLEY, D.W. (Ed.): *Making the Commons Work. Theory, Practice, and Policy*. San Francisco, California. 207-228.
- WASSON, R.J. (1978): A Debris Flow at Reshun, Pakistan, Hindukush. In: *Geografiska Annaler* 60A, 151-159.
- WATSON, D.J. (1989): The Evolution of Appropriate Resource-management Systems. In: BERKES, F. (Ed.): *Common Property Resources: Ecology and Community-based Sustainable Development*. London. 55-69.
- WHITEMAN, P.T.S. (1985): The Mountain Environment: An Agronomist's Perspective with a Case Study from Jumla, Nepal. In: *Mountain Research and Development* 5(2), 151-162.
- WHITEMAN, P.T.S (1988): Mountain Agronomy in Ethiopia, Nepal and Pakistan. In: ALLAN, N.J.R., G.W. KNAPP & C. STADEL (Eds.): *Human Impact on Mountains*. Totowa, New Jersey. 57-82.
- WEIERS, S. (1995): Zur Klimatologie des NW-Karakorum und Angrenzender Gebiete. Statistischen Analysen unter Einbeziehung von Wettersatellitenbildern und eines Geographischen Informationssystems (GIS). Bonn. (= *Bonner Geographische Abhandlungen* 92).
- WEIERS, S. (1998): Wechselwirkungen zwischen sommerlicher Monsunaktivität und außertropischer Westzirkulation in den Hochgebirgsregionen Nordpakistans. In: *Petermanns Geographische Mitteilungen* 142(2), 85-104.
- WINIGER, M. (1992): Gebirge und Hochgebirge: Forschungsentwicklung und - Perspektiven. In: *Geographische Rundschau* 44(7/8), 400-407.
- WITCOMBE, J.R. (1977): The Distribution of Cropping Systems in Northern Pakistan. In: *Agro-Ecosystems* 3, 285-290.
- WORLD BANK, Operation and Evaluation Department (1995): *Pakistan: Aga Khan Rural Support Programme, a third Evaluation*. World Bank, Washington. (= Report No 15157-pk).
- YAFENG, S. & Z. XIANGSONG (1984): Some Studies of the Batura Glacier in the Karakoram Mountains. In: MILLER, K.J. (Ed.): *The International Karakoram Project*. Vol. 1. Cambridge University Press, London. 51-63.
- YOUNGHUSBAND, F. E. (1896): *The Heart of a Continent: A Narrative of Travels in Manchuria, Across the Gobi Desert, Through the Himalayas, the Pamirs, and Chitral, 1884-1894*. London.

- ZAHID-UL-ISLAM (2001): Local Government System. An Introductory Booklet. (Urdu) Khanewal.
- ZAIDI, S.S.H. (1996): Occurrence of Seabuckthorn (*Hippophae Rhamnoides* L. Subsp. *Turkistanica* Rousi) in Pakistan. In: Pakistan Journal of Forestry 46, 115-119.
- ZIA, S. (2000): Growth Poverty Alleviation and Sustainable Resource Management in Mountain Areas of Pakistan. In: BANSKOTA, M., T.S. PAPOLA & J. RICHTER (Eds.): Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia. Feldafig. Deutsche Stiftung für Internationale Entwicklung. 225-246.
- ZURICK, D.N. (1990): Traditional Knowledge and Conservation as a Basis for Development in a West Nepal Village. In: Mountain Research and Development 10(1), 23-33.
- INDIA OFFICE LIBRARY & RECORDS: Frontier States: North West Frontier Province, from Office of the High Commissioner for the United Kingdom 1949 Secret. Political and External Files No. 23/13.  
IOL/P&S/12/3284/8121.
- INDIA OFFICE LIBRARY & RECORDS: Frontier States: Chitral Kashmir: Mastuj Agreement of 1914. Kashmir Suzerainty over Chitral, 16<sup>th</sup> February 1932 to 6<sup>th</sup> April 1932 and the Year 1933.  
IOL/P&S/12/3286/1607/4.
- INDIA OFFICE LIBRARY & RECORDS: Frontier States: Chitral Kashmir: Mastuj Agreement of 1914. Kashmir Suzerainty over Chitral, 16<sup>th</sup> February 1932 to 6<sup>th</sup> April 1932 and the Year 1933. Nazrana.  
IOL/P&S/12/3286/1607/5.
- INDIA OFFICE LIBRARY & RECORDS: Frontier States. Chitral: Death of the His Highness the Nawab of Chitral 1936; Financial Assistance to the Successor, 26<sup>th</sup> February 1928 to 16<sup>th</sup> August 1946.  
IOL/P&S/12/3295/1033/320.
- INDIA OFFICE LIBRARY & RECORDS: Frontier States: Political Diary of the Assistant Political Agent, Chitral for the Week Ending the 6<sup>th</sup> August 1901: Levy Duties.  
IOL/P&S/7/136/1065.
- INDIA OFFICE RECORDS: Chitral Affairs Volume IV File No. 433 of 1900 Improvement of Gilgit Chitral Road. File No. 162 of 1903 Gilgit Chitral Telegraph Line. Letter of Political Agent of Dir Chitral Swat Dated 11<sup>th</sup> April Simla 1889. IOR/2/1078/237/1C/160.
- INDIA OFFICE RECORDS: Chitral Affairs file No. 33-C of 1886 vols. II & III. A Detailed Statement of the Designation, &c., of the Chitral Officials.  
IOR/2/1077/235/11826/212-213.

INDIA OFFICE RECORDS: Chitral Affairs file No. 33-C of 1886 vols. II & III.  
REVENUE, IOR/2/1077/235/11826/214-213.

INDIA OFFICE RECORDS: Activities of His Highness the mehtar of Chitral.  
Repatriation of Chitral refugees in Gilgit Agency. Political agent in Gilgit telegram  
to the first assistant to the resident in Kashmir 25<sup>th</sup> November 1924: Religious per-  
secution of the mehtar and Maulai situation in Chitral.

IOR/2/ 1079/244/2.

INDIA OFFICE RECORDS: Activities of His Highness the Mehtar of Chitral.  
Political Agent in Gilgit Telegram to the First Assistant to the Resident in Kashmir  
9<sup>th</sup> April 1925: Maulai situation in Chitral.

IOR /2/1079/244/24.

### **Chitral Conservation Strategy Documents**

<http://www.ccs.iucnp.org-irrigation.pdf>: Irrigation Practices.

<http://www.ccs.iucnp.org-forest.pdf>: Forest and Grazing Land.

### **Newspapers cited from the Internet**

<http://www.dawn.com/2002/05/22/local26.htm>: Chitral: Tree Harvesting Proposal  
Rejected.

<http://www.dawn.com/2002/07/29text/local32htm>: Chitral: Land Settlement  
Opposed.

<http://www.dawn.com/2002/07/30/text/local30htm>: Chitral: Rs. 629 m Chitral  
Budget Approved.

<http://www.dawn.com/2002/08/20/text/local16.htm>: Peshawar: Proposed Land  
Settlement Opposed.

<http://www.dawn.com/2002/10/16/text/local14htm>: Peshawar: Chitral Assets Case  
Sent to Senior Judge.

<http://www.dawn.com/2003/09/23/text/local46.thm>: Skardu: Government Spending  
Rs. 740m on Wheat Supply to N. Areas.

<http://www.dawn.com/2003/11/22/text/ed.htm#3>: Conserving Mountain Areas.

<http://www.frontierpost.com.pk/2002/10/16/news2=city>: 50-years Old Property  
Dispute in Chitral PHC (Peshawar High Court) Accepts Appeal, Remand case to  
Illaqa Qazi.

## 8 List of Abbreviations

|          |   |
|----------|---|
| ADBP     | Agricultural Development Bank of Pakistan                               |
| AKDN     | Aga Khan Development Network  |
| AKRSP    | Aga Khan Rural Support Programme  |
| BA       | Bachelor of Arts  |
| °C       | Degree Centigrade (Temperature)   |
| CADP     | Chitral Area Development Programme                                      |
| CAK      | Culture Area Karakorum  |
| C & W    | Civil Works Department  |
| CCS      | Chitral Conservation Strategy   |
| CIDA     | Canadian Agency for International Development                           |
| DFC      | District Food Controller  |
| DFID     | Department for International Development                                |
| Fig      | Figure  |
| GONWFP   | Government of North West Frontier Province                              |
| GOP      | Government of Pakistan  |
| GTZ      | Gesellschaft für technische Zusammenarbeit                              |
| Hh       | Household   |
| IFAD     | International Fund for Agricultural Development, Rome                   |
| IMF      | International Monetary Fund   |
| IUCN     | International Fund for the Conservation of Nature and Natural Resources |
| M        | Meters (Altitude)   |
| m.a.s.l. | Meters Above Mean Sea Level (Altitude)                                  |
| n.d.     | No Date   |
| NGO      | Non Governmental Organisation   |
| No       | Not Relevant  |
| NWFP     | North West Frontier Province  |
| ODA      | Overseas Development Agency   |
| PPI      | Productive Physical Infrastructure                                      |
| PWD      | Public Works Department   |
| RCC      | Reinforced Cement and Concrete  |
| Rs       | Rupees  |
| UNICEF   | United Nations Children's Fund  |

|       |                                       |
|-------|---------------------------------------|
| VO    | Village Organisation                  |
| WAPDA | Water and Power Development Authority |
| WHO   | World Health Organisation             |
| WO    | Women Organisation                    |

# 9 Appendix

## App. 1.1 Village Odier: Household Data 2001 (1)

Appendix 1: Household data (Migration and off-farm Sources of Income)

| Hh                | Clan     | Working in the M E* | Returned from the M E* | Regular cash income | Retired from state services | Seasonal labour migrants | Educational migrants | Electricity |
|-------------------|----------|---------------------|------------------------|---------------------|-----------------------------|--------------------------|----------------------|-------------|
| 1                 | Bulay    | 0                   | 0                      | 0                   | 0                           | 0                        | 0                    | 1           |
| 2                 | Bulay    | 0                   | 0                      | 0                   | 0                           | 2                        | 0                    | 1           |
| 3                 | Bulay    | 0                   | 0                      | 0                   | 0                           | 1                        | 0                    | 0           |
| 4                 | Bulay    | 0                   | 0                      | 0                   | 0                           | 1                        | 0                    | 1           |
| 5                 | Bulay    | 1                   | 0                      | 0                   | 0                           | 0                        | 0                    | 0           |
| 6                 | Bulay    | 0                   | 0                      | 0                   | 0                           | 0                        | 0                    | 1           |
| 7                 | Bulay    | 0                   | 0                      | 0                   | 0                           | 1                        | 0                    | 0           |
| 8                 | Bulay    | 1                   | 0                      | 0                   | 0                           | 0                        | 0                    | 1           |
| 9                 | Bulay    | 0                   | 0                      | 1                   | 0                           | 1                        | 0                    | 0           |
| 10                | Bulay    | 0                   | 0                      | 0                   | 0                           | 1                        | 0                    | 0           |
| 11                | Bulay    | 0                   | 0                      | 0                   | 1                           | 0                        | 1                    | 1           |
| 12                | Bulay    | 1                   | 0                      | 1                   | 1                           | 1                        | 0                    | 1           |
| 13                | Bulay    | 0                   | 0                      | 0                   | 0                           | 1                        | 0                    | 1           |
| 14                | Bulay    | 2                   | 0                      | 0                   | 0                           | 0                        | 0                    | 0           |
| 15                | Bulay    | 0                   | 0                      | 0                   | 0                           | 0                        | 0                    | 1           |
| 16                | Bulay    | 2                   | 0                      | 0                   | 0                           | 1                        | 0                    | 1           |
| 17                | Bulay    | 0                   | 0                      | 0                   | 0                           | 2                        | 1                    | 1           |
| 18                | Bulay    | 0                   | 0                      | 0                   | 0                           | 1                        | 0                    | 1           |
| 19                | Bulay    | 1                   | 0                      | 0                   | 1                           | 0                        | 1                    | 1           |
| 20                | Bulay    | 0                   | 0                      | 0                   | 0                           | 1                        | 0                    | 1           |
| 21                | Bulay    | 0                   | 0                      | 1                   | 0                           | 0                        | 1                    | 0           |
| 22                | Bulay    | 0                   | 0                      | 0                   | 0                           | 0                        | 0                    | 1           |
| 23                | Bulay    | 0                   | 1                      | 1                   | 0                           | 0                        | 1                    | 1           |
| 24                | Bulay    | 0                   | 0                      | 0                   | 0                           | 1                        | 0                    | 0           |
| 25                | Bulay    | 1                   | 0                      | 0                   | 0                           | 0                        | 1                    | 1           |
| 26                | Bulay    | 1                   | 0                      | 1                   | 0                           | 0                        | 0                    | 0           |
| 27                | Bulay    | 0                   | 0                      | 0                   | 0                           | 1                        | 0                    | 0           |
| 28                | Bulay    | 0                   | 0                      | 2                   | 0                           | 1                        | 1                    | 1           |
| 29                | Bulay    | 1                   | 1                      | 1                   | 0                           | 2                        | 0                    | 1           |
| 30                | Bulay    | 0                   | 0                      | 0                   | 0                           | 1                        | 0                    | 1           |
| 31                | Bulay    | 1                   | 0                      | 0                   | 1                           | 0                        | 0                    | 1           |
| <b>Clan total</b> |          | <b>12</b>           | <b>2</b>               | <b>8</b>            | <b>4</b>                    | <b>20</b>                | <b>7</b>             | <b>21</b>   |
| 32                | Khushay  | 0                   | 0                      | 1                   | 0                           | 0                        | 0                    | 1           |
| 33                | Khushay  | 0                   | 0                      | 1                   | 0                           | 0                        | 1                    | 1           |
| 34                | Khushay  | 0                   | 1                      | 2                   | 0                           | 2                        | 1                    | 1           |
| <b>Clan total</b> |          | <b>0</b>            | <b>1</b>               | <b>4</b>            | <b>0</b>                    | <b>2</b>                 | <b>2</b>             | <b>3</b>    |
| 35                | Nasketek | 1                   | 0                      | 0                   | 0                           | 1                        | 1                    | 0           |
| 36                | Nasketek | 0                   | 0                      | 0                   | 0                           | 0                        | 0                    | 1           |
| 37                | Nasketek | 0                   | 0                      | 2                   | 1                           | 0                        | 0                    | 1           |
| 38                | Nasketek | 1                   | 0                      | 1                   | 0                           | 1                        | 1                    | 0           |
| 39                | Nasketek | 0                   | 0                      | 1                   | 0                           | 2                        | 0                    | 1           |
| 40                | Nasketek | 0                   | 0                      | 1                   | 0                           | 0                        | 0                    | 0           |
| 41                | Nasketek | 0                   | 1                      | 0                   | 0                           | 0                        | 0                    | 0           |
| 42                | Nasketek | 0                   | 0                      | 1                   | 0                           | 0                        | 1                    | 0           |
| 43                | Nasketek | 0                   | 0                      | 0                   | 0                           | 1                        | 0                    | 0           |
| 44                | Nasketek | 0                   | 0                      | 0                   | 0                           | 0                        | 0                    | 0           |
| <b>Clan total</b> |          | <b>2</b>            | <b>1</b>               | <b>6</b>            | <b>1</b>                    | <b>5</b>                 | <b>3</b>             | <b>3</b>    |

**App. 1.1 Village Odier Household Data 2001 (2)**

|                   |          |          |          |          |          |           |          |           |
|-------------------|----------|----------|----------|----------|----------|-----------|----------|-----------|
| 45                | Shadeyay | 0        | 0        | 0        | 0        | 2         | 0        | 1         |
| 46                | Shadeyay | 0        | 0        | 0        | 0        | 1         | 0        | 1         |
| 47                | Shadeyay | 0        | 0        | 0        | 0        | 1         | 0        | 1         |
| 48                | Shadeyay | 0        | 0        | 1        | 0        | 0         | 0        | 0         |
| 49                | Shadeyay | 0        | 0        | 0        | 0        | 0         | 0        | 0         |
| 50                | Shadeyay | 2        | 0        | 0        | 1        | 0         | 0        | 0         |
| <b>Clan total</b> |          | <b>2</b> | <b>0</b> | <b>1</b> | <b>1</b> | <b>4</b>  | <b>0</b> | <b>3</b>  |
| 51                | Shaipay  | 0        | 0        | 0        | 1        | 0         | 0        | 1         |
| 52                | Shaipay  | 0        | 0        | 0        | 0        | 1         | 0        | 1         |
| 53                | Shaipay  | 0        | 0        | 1        | 0        | 1         | 0        | 1         |
| 54                | Shaipay  | 0        | 0        | 0        | 0        | 0         | 0        | 1         |
| 55                | Shaipay  | 1        | 0        | 0        | 0        | 1         | 1        | 0         |
| 56                | Shaipay  | 0        | 0        | 0        | 0        | 1         | 1        | 1         |
| 57                | Shaipay  | 1        | 0        | 0        | 0        | 3         | 0        | 1         |
| 58                | Shaipay  | 0        | 0        | 3        | 1        | 3         | 1        | 1         |
| 59                | Shaipay  | 0        | 0        | 0        | 0        | 1         | 2        | 1         |
| 60                | Shaipay  | 1        | 1        | 2        | 0        | 1         | 0        | 1         |
| 61                | Shaipay  | 0        | 0        | 0        | 0        | 1         | 0        | 1         |
| 62                | Shaipay  | 2        | 0        | 1        | 0        | 0         | 1        | 1         |
| 63                | Shaipay  | 1        | 0        | 0        | 0        | 2         | 0        | 1         |
| 64                | Shaipay  | 2        | 0        | 0        | 0        | 0         | 1        | 1         |
| 65                | Shaipay  | 0        | 1        | 0        | 0        | 2         | 0        | 1         |
| 66                | Shaipay  | 0        | 0        | 0        | 0        | 0         | 0        | 0         |
| 67                | Shaipay  | 0        | 0        | 0        | 0        | 0         | 0        | 1         |
| <b>Clan total</b> |          | <b>8</b> | <b>2</b> | <b>7</b> | <b>2</b> | <b>17</b> | <b>7</b> | <b>15</b> |
| 68                | Somalay  | 0        | 1        | 0        | 0        | 3         | 0        | 1         |
| 69                | Somalay  | 0        | 0        | 0        | 0        | 1         | 1        | 1         |
| 70                | Somalay  | 0        | 0        | 0        | 0        | 0         | 1        | 0         |
| 71                | Somalay  | 0        | 0        | 0        | 1        | 1         | 0        | 0         |
| 72                | Somalay  | 0        | 0        | 0        | 0        | 1         | 0        | 1         |
| 73                | Somalay  | 0        | 0        | 0        | 0        | 1         | 0        | 1         |
| 74                | Somalay  | 0        | 0        | 0        | 0        | 0         | 0        | 0         |
| 75                | Somalay  | 0        | 0        | 1        | 0        | 0         | 0        | 0         |
| 76                | Somalay  | 0        | 1        | 0        | 0        | 1         | 0        | 1         |
| 77                | Somalay  | 1        | 0        | 0        | 0        | 2         | 1        | 1         |
| 78                | Somalay  | 1        | 0        | 0        | 0        | 1         | 0        | 1         |
| 79                | Somalay  | 0        | 0        | 0        | 0        | 1         | 0        | 1         |
| 80                | Somalay  | 0        | 0        | 1        | 0        | 2         | 0        | 1         |
| 81                | Somalay  | 0        | 0        | 1        | 0        | 0         | 0        | 0         |
| 82                | Somalay  | 0        | 0        | 0        | 0        | 0         | 0        | 1         |
| 83                | Somalay  | 1        | 0        | 0        | 0        | 1         | 0        | 1         |
| 84                | Somalay  | 0        | 0        | 0        | 1        | 0         | 0        | 1         |
| 85                | Somalay  | 0        | 0        | 0        | 0        | 1         | 0        | 1         |
| 86                | Somalay  | 1        | 0        | 0        | 1        | 1         | 0        | 1         |
| 87                | Somalay  | 0        | 0        | 0        | 0        | 1         | 0        | 0         |
| 88                | Somalay  | 1        | 0        | 0        | 0        | 1         | 0        | 1         |
| 89                | Somalay  | 0        | 0        | 0        | 1        | 1         | 0        | 0         |
| 90                | Somalay  | 0        | 1        | 0        | 0        | 2         | 0        | 1         |
| 91                | Somalay  | 1        | 1        | 1        | 0        | 1         | 0        | 1         |
| 92                | Somalay  | 0        | 0        | 0        | 0        | 1         | 0        | 1         |

**App. 1.1 Village Odier: Household Data 2001 (3)**

|                      |         |           |           |           |           |            |           |           |
|----------------------|---------|-----------|-----------|-----------|-----------|------------|-----------|-----------|
| 93                   | Somalay | 0         | 0         | 2         | 0         | 1          | 0         | 1         |
| 94                   | Somalay | 0         | 0         | 1         | 0         | 0          | 0         | 0         |
| 95                   | Somalay | 0         | 0         | 0         | 0         | 1          | 0         | 1         |
| 96                   | Somalay | 1         | 2         | 1         | 0         | 2          | 1         | 0         |
| 97                   | Somalay | 0         | 0         | 1         | 1         | 1          | 0         | 0         |
| 98                   | Somalay | 0         | 0         | 0         | 0         | 0          | 0         | 1         |
| 99                   | Somalay | 0         | 0         | 0         | 0         | 3          | 0         | 1         |
| 100                  | Somalay | 0         | 0         | 0         | 0         | 1          | 0         | 0         |
| 101                  | Somalay | 0         | 0         | 1         | 0         | 0          | 0         | 0         |
| 102                  | Somalay | 1         | 0         | 0         | 0         | 2          | 0         | 1         |
| 103                  | Somalay | 0         | 0         | 1         | 0         | 0          | 1         | 0         |
| 104                  | Somalay | 0         | 0         | 0         | 0         | 1          | 0         | 1         |
| 105                  | Somalay | 1         | 0         | 1         | 0         | 1          | 0         | 0         |
| 106                  | Somalay | 0         | 0         | 1         | 0         | 0          | 0         | 1         |
| 107                  | Somalay | 0         | 0         | 0         | 0         | 1          | 0         | 1         |
| 108                  | Somalay | 0         | 0         | 0         | 0         | 1          | 0         | 1         |
| 109                  | Somalay | 0         | 0         | 0         | 0         | 1          | 0         | 1         |
| 110                  | Somalay | 0         | 0         | 0         | 0         | 0          | 0         | 1         |
| 111                  | Somalay | 0         | 0         | 1         | 1         | 1          | 0         | 1         |
| 112                  | Somalay | 0         | 0         | 1         | 0         | 1          | 0         | 1         |
| 113                  | Somalay | 0         | 0         | 0         | 1         | 1          | 0         | 1         |
| 114                  | Somalay | 1         | 0         | 0         | 0         | 1          | 0         | 1         |
| 115                  | Somalay | 1         | 0         | 0         | 0         | 1          | 0         | 1         |
| 116                  | Somalay | 0         | 1         | 0         | 0         | 2          | 0         | 0         |
| 117                  | Somalay | 0         | 0         | 0         | 0         | 1          | 0         | 1         |
| 118                  | Somalay | 0         | 0         | 1         | 0         | 0          | 0         | 0         |
| 119                  | Somalay | 0         | 1         | 0         | 0         | 2          | 0         | 1         |
| 120                  | Somalay | 0         | 0         | 0         | 1         | 1          | 0         | 1         |
| 121                  | Somalay | 1         | 0         | 0         | 0         | 0          | 0         | 1         |
| 122                  | Somalay | 0         | 0         | 0         | 0         | 2          | 0         | 1         |
| <b>Clan total</b>    |         | <b>12</b> | <b>8</b>  | <b>16</b> | <b>8</b>  | <b>53</b>  | <b>5</b>  | <b>39</b> |
| <b>Village total</b> |         | <b>38</b> | <b>14</b> | <b>42</b> | <b>16</b> | <b>101</b> | <b>24</b> | <b>84</b> |



## App. 1.2 Village Odier: Household Data 2001 (1)

Household data (Land fragmentation and house ownership)

| Hh                | Clan     | Owner /<br>tenant | Total<br>owned | Rented      | 2 frag   | 3 frag    | 4 frag    | 1 h      | 2 h       | 3 h      |
|-------------------|----------|-------------------|----------------|-------------|----------|-----------|-----------|----------|-----------|----------|
| 1                 | Bulay    | 0                 | 1.38           | 0.00        | 0        | 1         | 0         | 0        | 1         | 0        |
| 2                 | Bulay    | 0                 | 5.99           | 0.78        | 0        | 0         | 1         | 1        | 0         | 0        |
| 3                 | Bulay    | 1                 | 2.07           | 0.71        | 0        | 1         | 0         | 0        | 1         | 0        |
| 4                 | Bulay    | 0                 | 2.33           | 0.00        | 0        | 1         | 0         | 0        | 1         | 0        |
| 5                 | Bulay    | 0                 | 1.06           | 0.00        | 0        | 1         | 0         | 0        | 1         | 0        |
| 6                 | Bulay    | 0                 | 2.88           | 0.00        | 0        | 1         | 0         | 1        | 0         | 0        |
| 7                 | Bulay    | 0                 | 3.29           | 0.00        | 0        | 0         | 1         | 0        | 1         | 0        |
| 8                 | Bulay    | 0                 | 0.88           | 0.00        | 0        | 1         | 0         | 0        | 1         | 0        |
| 9                 | Bulay    | 1                 | 4.39           | 1.43        | 0        | 1         | 0         | 0        | 1         | 0        |
| 10                | Bulay    | 0                 | 1.18           | 0.00        | 0        | 1         | 0         | 0        | 1         | 0        |
| 11                | Bulay    | 0                 | 1.77           | 0.00        | 0        | 0         | 1         | 0        | 1         | 0        |
| 12                | Bulay    | 0                 | 3.68           | 0.00        | 0        | 0         | 1         | 0        | 0         | 1        |
| 13                | Bulay    | 1                 | 1.76           | 0.52        | 0        | 1         | 0         | 0        | 1         | 0        |
| 14                | Bulay    | 0                 | 2.54           | 0.00        | 0        | 1         | 0         | 0        | 1         | 0        |
| 15                | Bulay    | 0                 | 1.10           | 0.00        | 0        | 0         | 1         | 1        | 0         | 0        |
| 16                | Bulay    | 1                 | 3.10           | 1.18        | 0        | 1         | 0         | 0        | 1         | 0        |
| 17                | Bulay    | 0                 | 0.71           | 0.00        | 1        | 0         | 0         | 0        | 1         | 0        |
| 18                | Bulay    | 0                 | 1.14           | 0.00        | 0        | 0         | 1         | 0        | 1         | 0        |
| 19                | Bulay    | 1                 | 3.18           | 0.83        | 0        | 0         | 1         | 0        | 1         | 0        |
| 20                | Bulay    | 1                 | 3.94           | 1.09        | 0        | 1         | 0         | 1        | 0         | 0        |
| 21                | Bulay    | 0                 | 3.39           | 0.00        | 0        | 1         | 0         | 1        | 0         | 0        |
| 22                | Bulay    | 0                 | 2.06           | 0.00        | 1        | 0         | 0         | 1        | 0         | 0        |
| 23                | Bulay    | 0                 | 1.90           | 0.16        | 1        | 0         | 0         | 1        | 0         | 0        |
| 24                | Bulay    | 0                 | 2.28           | 0.00        | 0        | 1         | 0         | 0        | 1         | 0        |
| 25                | Bulay    | 0                 | 1.06           | 0.00        | 1        | 0         | 0         | 1        | 0         | 0        |
| 26                | Bulay    | 1                 | 3.94           | 0.59        | 0        | 0         | 1         | 0        | 0         | 1        |
| 27                | Bulay    | 0                 | 2.79           | 0.00        | 0        | 0         | 1         | 0        | 1         | 0        |
| 28                | Bulay    | 0                 | 1.69           | 0.00        | 0        | 0         | 1         | 0        | 1         | 0        |
| 29                | Bulay    | 0                 | 2.11           | 0.00        | 0        | 1         | 0         | 0        | 0         | 1        |
| 30                | Bulay    | 0                 | 1.07           | 0.00        | 0        | 1         | 0         | 0        | 0         | 1        |
| 31                | Bulay    | 0                 | 1.08           | 0.00        | 0        | 1         | 0         | 0        | 1         | 0        |
| <b>Clan total</b> |          | <b>7</b>          | <b>71.71</b>   | <b>7.28</b> | <b>4</b> | <b>17</b> | <b>10</b> | <b>8</b> | <b>19</b> | <b>4</b> |
| 32                | Khushay  | 0                 | 0.48           | 0.00        | 1        | 0         | 0         | 1        | 0         | 0        |
| 33                | Khushay  | 0                 | 0.44           | 0.00        | 1        | 0         | 0         | 1        | 0         | 0        |
| 34                | Khushay  | 0                 | 0.89           | 0.00        | 1        | 0         | 0         | 1        | 0         | 0        |
| <b>Clan total</b> |          | <b>0</b>          | <b>1.82</b>    | <b>0.00</b> | <b>3</b> | <b>0</b>  | <b>0</b>  | <b>3</b> | <b>0</b>  | <b>0</b> |
| 35                | Nasketek | 0                 | 1.52           | 0.54        | 0        | 1         | 0         | 0        | 0         | 1        |
| 36                | Nasketek | 0                 | 1.42           | 0.00        | 0        | 1         | 0         | 1        | 0         | 0        |
| 37                | Nasketek | 0                 | 1.54           | 0.00        | 1        | 0         | 0         | 0        | 1         | 0        |
| 38                | Nasketek | 0                 | 2.68           | 0.00        | 0        | 1         | 0         | 0        | 1         | 0        |
| 39                | Nasketek | 0                 | 1.55           | 0.00        | 0        | 1         | 0         | 0        | 0         | 1        |
| 40                | Nasketek | 0                 | 0.54           | 0.00        | 1        | 0         | 0         | 0        | 1         | 0        |
| 41                | Nasketek | 0                 | 0.35           | 0.00        | 1        | 0         | 0         | 0        | 1         | 0        |
| 42                | Nasketek | 0                 | 2.46           | 0.00        | 0        | 1         | 0         | 0        | 1         | 0        |
| 43                | Nasketek | 0                 | 1.25           | 0.00        | 0        | 1         | 0         | 0        | 0         | 1        |
| 44                | Nasketek | 1                 | 1.92           | 1.47        | 1        | 0         | 0         | 0        | 1         | 0        |
| <b>Clan total</b> |          | <b>1</b>          | <b>15.21</b>   | <b>2.01</b> | <b>4</b> | <b>6</b>  | <b>0</b>  | <b>1</b> | <b>6</b>  | <b>3</b> |

**App. 1.2 Village Odier: Household Data 2001 (2)**

|                   |          |          |              |             |          |          |           |          |          |          |
|-------------------|----------|----------|--------------|-------------|----------|----------|-----------|----------|----------|----------|
| 45                | Shadeyay | 0        | 1.97         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 46                | Shadeyay | 1        | 0.71         | 0.22        | 1        | 0        | 0         | 0        | 1        | 0        |
| 47                | Shadeyay | 0        | 0.97         | 0.00        | 1        | 0        | 0         | 1        | 0        | 0        |
| 48                | Shadeyay | 1        | 0.45         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 49                | Shadeyay | 0        | 0.33         | 0.33        | 0        | 0        | 0         | 0        | 0        | 0        |
| 50                | Shadeyay | 1        | 1.65         | 0.25        | 1        | 0        | 0         | 1        | 0        | 0        |
| <b>Clan total</b> |          | <b>3</b> | <b>6.08</b>  | <b>0.80</b> | <b>5</b> | <b>0</b> | <b>0</b>  | <b>2</b> | <b>3</b> | <b>0</b> |
| 51                | Shaipay  | 0        | 2.43         | 0.00        | 1        | 0        | 0         | 1        | 0        | 0        |
| 52                | Shaipay  | 0        | 0.96         | 0.00        | 0        | 0        | 1         | 1        | 0        | 0        |
| 53                | Shaipay  | 0        | 0.71         | 0.00        | 0        | 0        | 1         | 0        | 0        | 1        |
| 54                | Shaipay  | 1        | 1.37         | 0.21        | 0        | 0        | 1         | 0        | 1        | 0        |
| 55                | Shaipay  | 0        | 1.49         | 0.00        | 0        | 0        | 1         | 0        | 1        | 0        |
| 56                | Shaipay  | 0        | 2.55         | 0.16        | 0        | 0        | 1         | 0        | 1        | 0        |
| 57                | Shaipay  | 1        | 2.04         | 0.00        | 0        | 0        | 1         | 0        | 0        | 1        |
| 58                | Shaipay  | 1        | 5.41         | 0.43        | 0        | 0        | 1         | 0        | 0        | 1        |
| 59                | Shaipay  | 0        | 1.46         | 0.00        | 0        | 0        | 1         | 0        | 1        | 0        |
| 60                | Shaipay  | 0        | 5.50         | 0.00        | 0        | 0        | 1         | 0        | 0        | 1        |
| 61                | Shaipay  | 0        | 0.84         | 0.00        | 0        | 0        | 1         | 1        | 0        | 0        |
| 62                | Shaipay  | 0        | 4.11         | 0.00        | 0        | 0        | 1         | 0        | 1        | 0        |
| 63                | Shaipay  | 0        | 2.01         | 0.00        | 0        | 0        | 1         | 0        | 1        | 0        |
| 64                | Shaipay  | 1        | 1.97         | 0.00        | 0        | 0        | 1         | 0        | 1        | 0        |
| 65                | Shaipay  | 1        | 2.45         | 0.83        | 0        | 0        | 1         | 1        | 0        | 0        |
| 66                | Shaipay  | 0        | 0.87         | 0.00        | 0        | 0        | 0         | 0        | 0        | 0        |
| 67                | Shaipay  | 0        | 2.28         | 0.00        | 0        | 0        | 1         | 1        | 0        | 0        |
| <b>Clan total</b> |          | <b>5</b> | <b>38.46</b> | <b>1.63</b> | <b>1</b> | <b>0</b> | <b>15</b> | <b>5</b> | <b>7</b> | <b>4</b> |
| 68                | Somalay  | 1        | 0.96         | 0.20        | 1        | 0        | 0         | 0        | 1        | 0        |
| 69                | Somalay  | 1        | 1.83         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 70                | Somalay  | 0        | 1.93         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 71                | Somalay  | 0        | 0.84         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 72                | Somalay  | 0        | 0.80         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 73                | Somalay  | 0        | 1.87         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 74                | Somalay  | 0        | 1.98         | 0.00        | 0        | 1        | 0         | 0        | 0        | 1        |
| 75                | Somalay  | 0        | 4.44         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 76                | Somalay  | 0        | 0.51         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 77                | Somalay  | 1        | 3.73         | 0.66        | 1        | 0        | 0         | 0        | 1        | 0        |
| 78                | Somalay  | 0        | 1.44         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 79                | Somalay  | 0        | 1.07         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 80                | Somalay  | 0        | 1.12         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 81                | Somalay  | 0        | 0.34         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 82                | Somalay  | 0        | 0.81         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 83                | Somalay  | 0        | 6.23         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 84                | Somalay  | 1        | 2.97         | 1.07        | 1        | 0        | 0         | 0        | 1        | 0        |
| 85                | Somalay  | 0        | 1.96         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 86                | Somalay  | 1        | 4.75         | 0.70        | 1        | 0        | 0         | 1        | 0        | 0        |
| 87                | Somalay  | 1        | 1.35         | 1.04        | 1        | 0        | 0         | 0        | 1        | 0        |
| 88                | Somalay  | 0        | 1.02         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 89                | Somalay  | 1        | 0.59         | 0.00        | 1        | 0        | 0         | 0        | 1        | 0        |
| 90                | Somalay  | 0        | 3.04         | 0.00        | 0        | 0        | 1         | 0        | 1        | 0        |
| 91                | Somalay  | 0        | 5.12         | 0.00        | 0        | 1        | 0         | 0        | 1        | 0        |
| 92                | Somalay  | 1        | 5.04         | 2.06        | 1        | 0        | 0         | 0        | 1        | 0        |

**App. 1.2 Village Odier: Household Data 2001 (3)**

|                      |         |           |               |              |           |           |           |           |           |           |
|----------------------|---------|-----------|---------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|
| 93                   | Somalay | 0         | 0.85          | 0.18         | 0         | 1         | 0         | 0         | 1         | 0         |
| 94                   | Somalay | 1         | 1.03          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 95                   | Somalay | 0         | 3.03          | 0.00         | 0         | 1         | 0         | 0         | 1         | 0         |
| 96                   | Somalay | 0         | 0.34          | 0.00         | 0         | 0         | 1         | 0         | 1         | 0         |
| 97                   | Somalay | 1         | 0.89          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 98                   | Somalay | 0         | 10.92         | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 99                   | Somalay | 0         | 1.44          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 100                  | Somalay | 0         | 2.02          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 101                  | Somalay | 0         | 0.56          | 0.00         | 1         | 0         | 0         | 1         | 0         | 0         |
| 102                  | Somalay | 0         | 2.31          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 103                  | Somalay | 0         | 8.29          | 0.00         | 0         | 0         | 1         | 0         | 0         | 1         |
| 104                  | Somalay | 0         | 3.66          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 105                  | Somalay | 0         | 3.86          | 0.00         | 0         | 1         | 0         | 0         | 1         | 0         |
| 106                  | Somalay | 0         | 2.74          | 1.48         | 1         | 0         | 0         | 0         | 1         | 0         |
| 107                  | Somalay | 0         | 1.38          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 108                  | Somalay | 0         | 0.90          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 109                  | Somalay | 0         | 0.88          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 110                  | Somalay | 0         | 1.99          | 0.00         | 0         | 1         | 0         | 0         | 1         | 0         |
| 111                  | Somalay | 0         | 3.74          | 0.00         | 0         | 0         | 1         | 0         | 1         | 0         |
| 112                  | Somalay | 0         | 1.49          | 0.00         | 0         | 1         | 0         | 0         | 1         | 0         |
| 113                  | Somalay | 0         | 0.93          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 114                  | Somalay | 1         | 3.42          | 0.70         | 1         | 0         | 0         | 0         | 1         | 0         |
| 115                  | Somalay | 0         | 4.79          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 116                  | Somalay | 0         | 1.19          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 117                  | Somalay | 0         | 1.38          | 0.00         | 1         | 0         | 0         | 0         | 0         | 1         |
| 118                  | Somalay | 1         | 3.94          | 0.53         | 0         | 1         | 0         | 0         | 1         | 0         |
| 119                  | Somalay | 0         | 0.68          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 120                  | Somalay | 0         | 3.02          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| 121                  | Somalay | 0         | 3.35          | 0.00         | 0         | 1         | 0         | 0         | 1         | 0         |
| 122                  | Somalay | 0         | 0.91          | 0.00         | 1         | 0         | 0         | 0         | 1         | 0         |
| <b>Clan total</b>    |         | <b>12</b> | <b>131.49</b> | <b>8.61</b>  | <b>42</b> | <b>9</b>  | <b>4</b>  | <b>2</b>  | <b>50</b> | <b>3</b>  |
| <b>Village total</b> |         | <b>28</b> | <b>264.77</b> | <b>20.33</b> | <b>59</b> | <b>32</b> | <b>29</b> | <b>21</b> | <b>85</b> | <b>14</b> |

**App. 1.3 Village Odier: Household Data 2001 (1)**

| Household data (Population Structure and share in village commons) |          |      |        |      |       |                |                  |        |              |             |
|--|----------|------|--------|------|-------|----------------|------------------|--------|--------------|-------------|
| Hh   | Clan     | Male | Female | Boys | Girls | Total children | Total population | Nichag | Ghazi-noghor | Moroyan-pon |
| 1  | Bulay    | 1    | 1      | 0    | 0     | 0              | 2                | 0      | 1            | 0           |
| 2  | Bulay    | 3    | 2      | 0    | 2     | 2              | 7                | 0      | 1            | 0           |
| 3  | Bulay    | 2    | 3      | 0    | 1     | 1              | 6                | 0      | 1            | 0           |
| 4  | Bulay    | 1    | 1      | 2    | 3     | 5              | 7                | 1      | 0            | 0           |
| 5  | Bulay    | 1    | 1      | 1    | 1     | 2              | 4                | 0      | 1            | 0           |
| 6  | Bulay    | 1    | 1      | 0    | 0     | 0              | 2                | 0      | 1            | 0           |
| 7  | Bulay    | 2    | 1      | 4    | 2     | 6              | 9                | 0      | 1            | 0           |
| 8  | Bulay    | 2    | 2      | 0    | 0     | 0              | 4                | 0      | 1            | 0           |
| 9  | Bulay    | 3    | 1      | 1    | 5     | 6              | 10               | 0      | 1            | 0           |
| 10   | Bulay    | 1    | 1      | 1    | 1     | 2              | 4                | 0      | 1            | 0           |
| 11   | Bulay    | 1    | 1      | 4    | 2     | 6              | 8                | 0      | 1            | 0           |
| 12   | Bulay    | 4    | 3      | 4    | 2     | 6              | 13               | 0      | 1            | 0           |
| 13   | Bulay    | 1    | 1      | 6    | 1     | 7              | 9                | 0      | 1            | 0           |
| 14   | Bulay    | 3    | 3      | 0    | 1     | 1              | 7                | 0      | 1            | 0           |
| 15   | Bulay    | 1    | 1      | 4    | 2     | 6              | 8                | 0      | 1            | 0           |
| 16   | Bulay    | 4    | 3      | 3    | 1     | 4              | 11               | 1      | 0            | 0           |
| 17   | Bulay    | 2    | 1      | 2    | 0     | 2              | 5                | 0      | 1            | 0           |
| 18   | Bulay    | 2    | 1      | 1    | 1     | 2              | 5                | 0      | 1            | 0           |
| 19   | Bulay    | 3    | 3      | 5    | 2     | 7              | 13               | 0      | 1            | 0           |
| 20   | Bulay    | 1    | 1      | 1    | 1     | 2              | 4                | 0      | 1            | 0           |
| 21   | Bulay    | 2    | 3      | 0    | 5     | 6              | 11               | 0      | 1            | 0           |
| 22   | Bulay    | 1    | 2      | 1    | 0     | 1              | 4                | 0      | 1            | 0           |
| 23   | Bulay    | 1    | 2      | 3    | 4     | 7              | 10               | 0      | 1            | 0           |
| 24   | Bulay    | 1    | 1      | 2    | 5     | 7              | 9                | 1      | 0            | 0           |
| 25   | Bulay    | 2    | 2      | 1    | 2     | 3              | 7                | 0      | 1            | 0           |
| 26   | Bulay    | 3    | 3      | 7    | 4     | 11             | 17               | 0      | 1            | 0           |
| 27   | Bulay    | 2    | 2      | 0    | 0     | 0              | 4                | 0      | 1            | 0           |
| 28   | Bulay    | 4    | 3      | 3    | 1     | 4              | 11               | 0      | 1            | 0           |
| 29   | Bulay    | 5    | 5      | 5    | 2     | 7              | 17               | 1      | 0            | 0           |
| 30   | Bulay    | 1    | 1      | 4    | 3     | 7              | 9                | 0      | 1            | 0           |
| 31   | Bulay    | 2    | 0      | 1    | 3     | 4              | 6                | 0      | 1            | 0           |
| Clan total   |          | 63   | 56     | 66   | 57    | 124            | 243              | 4      | 27           | 0           |
| 32   | Khushay  | 1    | 1      | 1    | 3     | 4              | 6                | 0      | 1            | 0           |
| 33   | Khushay  | 2    | 1      | 2    | 4     | 6              | 9                | 0      | 1            | 0           |
| 34   | Khushay  | 4    | 4      | 1    | 6     | 7              | 15               | 0      | 1            | 0           |
| Clan total   |          | 7    | 6      | 4    | 13    | 17             | 30               | 0      | 3            | 0           |
| 35   | Nasketek | 3    | 3      | 4    | 1     | 5              | 11               | 0      | 1            | 0           |
| 36   | Nasketek | 1    | 1      | 2    | 2     | 4              | 6                | 1      | 0            | 0           |
| 37   | Nasketek | 3    | 4      | 3    | 2     | 5              | 12               | 0      | 1            | 0           |
| 38   | Nasketek | 6    | 3      | 4    | 3     | 7              | 16               | 0      | 1            | 0           |
| 39   | Nasketek | 4    | 2      | 3    | 4     | 7              | 13               | 0      | 1            | 0           |
| 40   | Nasketek | 1    | 1      | 1    | 2     | 3              | 5                | 0      | 1            | 0           |
| 41   | Nasketek | 1    | 1      | 3    | 0     | 3              | 5                | 0      | 1            | 0           |
| 42   | Nasketek | 2    | 2      | 2    | 3     | 5              | 8                | 1      | 0            | 0           |
| 43   | Nasketek | 3    | 1      | 0    | 2     | 2              | 6                | 0      | 1            | 0           |
| 44   | Nasketek | 1    | 2      | 3    | 3     | 6              | 9                | 0      | 1            | 0           |
| Clan total   |          | 25   | 20     | 25   | 22    | 47             | 91               | 2      | 8            | 0           |

**App. 1.3 Village Odier: Household Data 2001 (2)**

|                   |          |           |           |           |           |           |            |          |           |          |
|-------------------|----------|-----------|-----------|-----------|-----------|-----------|------------|----------|-----------|----------|
| 45                | Shadeyay | 4         | 4         | 3         | 6         | 9         | 17         | 0        | 0         | 1        |
| 46                | Shadeyay | 1         | 1         | 2         | 3         | 5         | 7          | 1        | 0         | 0        |
| 47                | Shadeyay | 1         | 1         | 2         | 4         | 6         | 8          | 0        | 0         | 1        |
| 48                | Shadeyay | 1         | 3         | 2         | 0         | 2         | 6          | 1        | 0         | 0        |
| 49                | Shadeyay | 0         |           | 0         | 0         | 0         | 0          | 0        | 0         | 0        |
| 50                | Shadeyay | 5         | 3         | 2         | 2         | 4         | 12         | 0        | 1         | 0        |
| <b>Clan total</b> |          | <b>12</b> | <b>12</b> | <b>11</b> | <b>15</b> | <b>26</b> | <b>50</b>  | <b>2</b> | <b>1</b>  | <b>2</b> |
| 51                | Shaipay  | 2         | 2         | 3         | 2         | 5         | 9          | 1        | 0         | 0        |
| 52                | Shaipay  | 1         | 1         | 2         | 1         | 3         | 4          | 0        | 1         | 0        |
| 53                | Shaipay  | 2         | 2         | 1         | 1         | 2         | 7          | 0        | 1         | 0        |
| 54                | Shaipay  | 1         | 1         | 4         | 1         | 5         | 7          | 0        | 1         | 0        |
| 55                | Shaipay  | 3         | 2         | 3         | 1         | 4         | 9          | 0        | 1         | 0        |
| 56                | Shaipay  | 3         | 2         | 2         | 1         | 3         | 8          | 0        | 1         | 0        |
| 57                | Shaipay  | 5         | 5         | 1         | 6         | 7         | 17         | 0        | 1         | 0        |
| 58                | Shaipay  | 7         | 5         | 4         | 3         | 7         | 20         | 1        | 0         | 0        |
| 59                | Shaipay  | 2         | 1         | 1         | 5         | 6         | 9          | 0        | 1         | 0        |
| 60                | Shaipay  | 6         | 5         | 4         | 3         | 7         | 18         | 1        | 0         | 0        |
| 61                | Shaipay  | 1         | 1         | 4         | 2         | 6         | 8          | 0        | 1         | 0        |
| 62                | Shaipay  | 5         | 4         | 5         | 4         | 9         | 18         | 1        | 0         | 0        |
| 63                | Shaipay  | 4         | 2         | 1         | 0         | 1         | 7          | 0        | 1         | 0        |
| 64                | Shaipay  | 4         | 3         | 1         | 3         | 4         | 11         | 0        | 0         | 1        |
| 65                | Shaipay  | 4         | 4         | 4         | 3         | 7         | 15         | 0        | 1         | 0        |
| 66                | Shaipay  | 0         | 0         | 0         | 0         | 0         | 0          | 0        | 0         | 0        |
| 67                | Shaipay  | 1         | 1         | 0         | 0         | 0         | 2          | 0        | 1         | 0        |
| <b>Clan total</b> |          | <b>51</b> | <b>41</b> | <b>40</b> | <b>36</b> | <b>76</b> | <b>169</b> | <b>4</b> | <b>11</b> | <b>1</b> |
| 68                | Somalay  | 3         | 1         | 1         | 4         | 5         | 9          | 0        | 0         | 1        |
| 69                | Somalay  | 2         | 2         | 3         | 0         | 3         | 7          | 1        | 0         | 0        |
| 70                | Somalay  | 1         | 1         | 2         | 4         | 6         | 8          | 0        | 0         | 1        |
| 71                | Somalay  | 1         | 1         | 2         | 1         | 3         | 5          | 1        | 0         | 0        |
| 72                | Somalay  | 1         | 3         | 4         | 2         | 6         | 10         | 1        | 0         | 0        |
| 73                | Somalay  | 2         | 2         | 3         | 4         | 7         | 11         | 0        | 0         | 1        |
| 74                | Somalay  | 1         | 2         | 3         | 4         | 7         | 10         | 1        | 0         | 0        |
| 75                | Somalay  | 4         | 2         | 3         | 6         | 9         | 15         | 0        | 0         | 1        |
| 76                | Somalay  | 1         | 1         | 1         | 5         | 6         | 8          | 0        | 0         | 1        |
| 77                | Somalay  | 4         | 3         | 9         | 6         | 15        | 22         | 0        | 0         | 1        |
| 78                | Somalay  | 3         | 2         | 1         | 3         | 4         | 9          | 1        | 0         | 0        |
| 79                | Somalay  | 1         | 1         | 2         | 3         | 6         | 7          | 0        | 0         | 1        |
| 80                | Somalay  | 2         | 1         | 2         | 3         | 5         | 8          | 0        | 0         | 1        |
| 81                | Somalay  | 1         | 2         | 0         | 3         | 3         | 6          | 1        | 0         | 0        |
| 82                | Somalay  | 1         | 1         | 1         | 0         | 1         | 3          | 1        | 0         | 0        |
| 83                | Somalay  | 3         | 2         | 1         | 2         | 3         | 8          | 0        | 0         | 1        |
| 84                | Somalay  | 1         | 1         | 4         | 1         | 5         | 7          | 1        | 0         | 0        |
| 85                | Somalay  | 2         | 2         | 1         | 5         | 6         | 10         | 1        | 0         | 0        |
| 86                | Somalay  | 4         | 2         | 6         | 0         | 6         | 12         | 0        | 0         | 1        |
| 87                | Somalay  | 1         | 1         | 4         | 2         | 6         | 8          | 1        | 0         | 0        |
| 88                | Somalay  | 3         | 2         | 2         | 0         | 2         | 7          | 1        | 0         | 0        |
| 89                | Somalay  | 1         | 1         | 1         | 2         | 3         | 5          | 0        | 0         | 1        |
| 90                | Somalay  | 6         | 3         | 3         | 3         | 6         | 15         | 1        | 0         | 0        |
| 91                | Somalay  | 5         | 5         | 3         | 8         | 11        | 21         | 1        | 0         | 0        |

**App. 1.3 Village Odier: Household Data 2001 (3)**

|               |         |     |     |     |     |     |      |    |    |    |
|---------------|---------|-----|-----|-----|-----|-----|------|----|----|----|
| 92            | Somalay | 1   | 1   | 2   | 0   | 2   | 4    | 0  | 0  | 1  |
| 93            | Somalay | 5   | 4   | 3   | 5   | 8   | 17   | 1  | 0  | 0  |
| 94            | Somalay | 1   | 1   | 3   | 1   | 4   | 6    | 1  | 0  | 0  |
| 95            | Somalay | 2   | 1   | 3   | 0   | 3   | 6    | 0  | 0  | 1  |
| 96            | Somalay | 7   | 7   | 1   | 10  | 11  | 25   | 0  | 0  | 1  |
| 97            | Somalay | 3   | 3   | 5   | 4   | 9   | 15   | 1  | 0  | 0  |
| 98            | Somalay | 1   | 1   | 1   | 4   | 5   | 7    | 1  | 0  | 0  |
| 99            | Somalay | 1   | 1   | 4   | 0   | 4   | 6    | 0  | 0  | 1  |
| 100           | Somalay | 1   | 1   | 2   | 2   | 4   | 6    | 0  | 0  | 1  |
| 101           | Somalay | 1   | 1   | 4   | 3   | 7   | 9    | 1  | 0  | 0  |
| 102           | Somalay | 4   | 4   | 3   | 2   | 5   | 13   | 0  | 0  | 1  |
| 103           | Somalay | 3   | 2   | 1   | 3   | 4   | 9    | 1  | 0  | 0  |
| 104           | Somalay | 1   | 1   | 0   | 3   | 3   | 5    | 0  | 0  | 1  |
| 105           | Somalay | 4   | 4   | 6   | 3   | 9   | 17   | 0  | 0  | 1  |
| 106           | Somalay | 1   | 1   | 2   | 1   | 3   | 5    | 1  | 0  | 0  |
| 107           | Somalay | 1   | 1   | 4   | 1   | 5   | 7    | 0  | 0  | 1  |
| 108           | Somalay | 1   | 1   | 2   | 3   | 5   | 7    | 1  | 0  | 0  |
| 109           | Somalay | 1   | 1   | 2   | 0   | 2   | 4    | 1  | 0  | 0  |
| 110           | Somalay | 1   | 1   | 0   | 0   | 0   | 2    | 1  | 0  | 0  |
| 111           | Somalay | 4   | 3   | 5   | 4   | 9   | 16   | 1  | 0  | 0  |
| 112           | Somalay | 3   | 2   | 0   | 0   | 0   | 5    | 0  | 0  | 1  |
| 113           | Somalay | 2   | 1   | 2   | 1   | 3   | 6    | 0  | 0  | 1  |
| 114           | Somalay | 4   | 3   | 0   | 3   | 3   | 10   | 0  | 0  | 1  |
| 115           | Somalay | 3   | 3   | 0   | 2   | 2   | 8    | 0  | 0  | 1  |
| 116           | Somalay | 2   | 2   | 2   | 2   | 4   | 8    | 1  | 0  | 0  |
| 117           | Somalay | 2   | 1   | 5   | 1   | 6   | 9    | 1  | 0  | 0  |
| 118           | Somalay | 3   | 3   | 2   | 4   | 6   | 12   | 1  | 0  | 0  |
| 119           | Somalay | 2   | 1   | 5   | 1   | 6   | 9    | 0  | 0  | 1  |
| 120           | Somalay | 4   | 4   | 1   | 3   | 4   | 12   | 0  | 0  | 1  |
| 121           | Somalay | 1   | 2   | 5   | 4   | 9   | 12   | 1  | 0  | 0  |
| 122           | Somalay | 3   | 2   | 1   | 3   | 4   | 9    | 0  | 0  | 1  |
| Cian total    |         | 127 | 108 | 138 | 144 | 283 | 517  | 28 | 0  | 27 |
| Village total |         | 285 | 243 | 284 | 287 | 573 | 1100 | 40 | 50 | 30 |

### App. 1.4 Village Odier: Household Data 2001 (1)

| Household data (Livestock Ownership and changes 1980-2001) |          |            |           |           |           |           |           |          |          |                   |                    |                      |
|--|----------|------------|-----------|-----------|-----------|-----------|-----------|----------|----------|-------------------|--------------------|----------------------|
| Hh   | Clan     | Sheep      | Goats     | Cows      | Bulls     | Calves    | Total     | Yaks     | Donkeys  | Yaks owners 1980s | Goats owners 1980s | Goats owners in 2001 |
| 1  | Bulay    | 14         | 0         | 1         | 0         | 2         | 3         | 0        | 0        | 0                 | 1                  | 1                    |
| 2  | Bulay    | 8          | 3         | 3         | 2         | 0         | 5         | 0        | 0        | 0                 | 1                  | 0                    |
| 3  | Bulay    | 6          | 0         | 2         | 1         | 0         | 3         | 0        | 0        | 0                 | 1                  | 0                    |
| 4  | Bulay    | 12         | 0         | 1         | 1         | 1         | 3         | 0        | 0        | 1                 | 1                  | 0                    |
| 5  | Bulay    | 0          | 0         | 0         | 0         | 0         | 0         | 0        | 0        | 1                 | *                  | 0                    |
| 6  | Bulay    | 6          | 0         | 3         | 0         | 1         | 4         | 0        | 0        | 0                 | 1                  | 0                    |
| 7  | Bulay    | 10         | 0         | 1         | 0         | 1         | 2         | 0        | 0        | 0                 | *                  | 0                    |
| 8  | Bulay    | 4          | 0         | 1         | 0         | 0         | 1         | 0        | 0        | 0                 | 1                  | 0                    |
| 9  | Bulay    | 12         | 5         | 3         | 1         | 0         | 4         | 0        | 0        | 1                 | 1                  | 1                    |
| 10   | Bulay    | 2          | 0         | 2         | 1         | 1         | 4         | 0        | 0        | 0                 | 1                  | 0                    |
| 11   | Bulay    | 5          | 0         | 3         | 0         | 1         | 4         | 0        | 1        | 0                 | 1                  | 0                    |
| 12   | Bulay    | 12         | 14        | 3         | 2         | 2         | 7         | 0        | 0        | 1                 | 1                  | 1                    |
| 13   | Bulay    | 6          | 0         | 1         | 1         | 1         | 3         | 0        | 0        | 0                 | 1                  | 0                    |
| 14   | Bulay    | 13         | 0         | 2         | 1         | 1         | 4         | 0        | 0        | 1                 | 1                  | 0                    |
| 15   | Bulay    | 3          | 0         | 1         | 0         | 1         | 2         | 0        | 0        | 0                 | *                  | 0                    |
| 16   | Bulay    | 8          | 14        | 2         | 0         | 2         | 4         | 0        | 0        | 0                 | 1                  | 1                    |
| 17   | Bulay    | 0          | 0         | 2         | 0         | 0         | 2         | 0        | 0        | 0                 | 0                  | 0                    |
| 18   | Bulay    | 8          | 1         | 1         | 0         | 0         | 1         | 0        | 0        | 0                 | 1                  | 0                    |
| 19   | Bulay    | 6          | 5         | 2         | 1         | 0         | 3         | 0        | 0        | 0                 | 1                  | 0                    |
| 20   | Bulay    | 5          | 0         | 1         | 1         | 1         | 3         | 0        | 0        | 0                 | 1                  | 0                    |
| 21   | Bulay    | 3          | 0         | 2         | 1         | 0         | 3         | 0        | 0        | 0                 | 1                  | 0                    |
| 22   | Bulay    | 6          | 0         | 1         | 1         | 1         | 3         | 0        | 0        | 0                 | 1                  | 0                    |
| 23   | Bulay    | 3          | 3         | 1         | 1         | 1         | 3         | 0        | 0        | 0                 | 1                  | 0                    |
| 24   | Bulay    | 5          | 4         | 2         | 0         | 1         | 3         | 0        | 0        | 0                 | 1                  | 0                    |
| 25   | Bulay    | 4          | 0         | 1         | 0         | 1         | 2         | 0        | 0        | 0                 | *                  | 0                    |
| 26   | Bulay    | 12         | 12        | 3         | 1         | 2         | 6         | 0        | 0        | 1                 | 1                  | 1                    |
| 27   | Bulay    | 6          | 0         | 3         | 0         | 1         | 4         | 0        | 0        | 0                 | 1                  | 0                    |
| 28   | Bulay    | 2          | 0         | 1         | 1         | 1         | 3         | 0        | 0        | 0                 | 1                  | 0                    |
| 29   | Bulay    | 6          | 14        | 2         | 1         | 1         | 4         | 0        | 1        | 0                 | 1                  | 0                    |
| 30   | Bulay    | 5          | 0         | 1         | 0         | 0         | 1         | 0        | 0        | 0                 | *                  | 0                    |
| 31   | Bulay    | 5          | 0         | 2         | 1         | 0         | 3         | 0        | 0        | 0                 | 1                  | 0                    |
| <b>Clan total</b>  |          | <b>197</b> | <b>75</b> | <b>54</b> | <b>19</b> | <b>24</b> | <b>97</b> | <b>0</b> | <b>2</b> | <b>6</b>          | <b>25</b>          | <b>5</b>             |
| 32   | Khushay  | 2          | 0         | 1         | 0         | 1         | 2         | 0        | 0        | 0                 | *                  | 0                    |
| 33   | Khushay  | 4          | 0         | 1         | 0         | 1         | 2         | 0        | 0        | 0                 | *                  | 0                    |
| 34   | Khushay  | 4          | 0         | 3         | 1         | 2         | 6         | 0        | 0        | 0                 | 1                  | 0                    |
| <b>Clan total</b>  |          | <b>10</b>  | <b>0</b>  | <b>5</b>  | <b>1</b>  | <b>4</b>  | <b>10</b> | <b>0</b> | <b>0</b> | <b>0</b>          | <b>1</b>           | <b>0</b>             |
| 35   | Nasketek | 6          | 0         | 3         | 0         | 1         | 4         | 0        | 0        | 0                 | 1                  | 0                    |
| 36   | Nasketek | 0          | 0         | 2         | 0         | 2         | 4         | 0        | 0        | 0                 | *                  | 0                    |
| 37   | Nasketek | 14         | 0         | 2         | 1         | 2         | 5         | 0        | 0        | 0                 | 1                  | 0                    |
| 38   | Nasketek | 8          | 10        | 2         | 1         | 2         | 5         | 0        | 0        | 1                 | 1                  | 1                    |
| 39   | Nasketek | 12         | 0         | 2         | 0         | 2         | 4         | 0        | 0        | 0                 | 1                  | 1                    |
| 40   | Nasketek | 2          | 0         | 1         | 0         | 0         | 1         | 0        | 0        | 0                 | 1                  | 0                    |
| 41   | Nasketek | 0          | 0         | 1         | 0         | 1         | 2         | 0        | 0        | 0                 | *                  | 0                    |
| 42   | Nasketek | 4          | 4         | 2         | 1         | 3         | 6         | 0        | 0        | 0                 | 1                  | 1                    |
| 43   | Nasketek | 2          | 0         | 2         | 0         | 1         | 3         | 0        | 0        | 0                 | 1                  | 0                    |
| 44   | Nasketek | 8          | 8         | 2         | 0         | 2         | 4         | 0        | 0        | 0                 | 1                  | 1                    |
| <b>Clan total</b>  |          | <b>56</b>  | <b>22</b> | <b>19</b> | <b>3</b>  | <b>16</b> | <b>38</b> | <b>0</b> | <b>0</b> | <b>1</b>          | <b>8</b>           | <b>4</b>             |

**App. 1.4 Village Odier: Household Data 2001 (2)**

|                   |          |            |           |           |           |           |           |          |          |          |           |          |
|-------------------|----------|------------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|-----------|----------|
| 45                | Shadeyay | 8          | 10        | 2         | 1         | 2         | 5         | 0        | 0        | 0        | 1         | 1        |
| 46                | Shadeyay | 7          | 8         | 1         | 0         | 1         | 2         | 0        | 0        | 0        | 1         | 0        |
| 47                | Shadeyay | 6          | 0         | 3         | 0         | 1         | 4         | 0        | 0        | 0        | *         | 0        |
| 48                | Shadeyay | 8          | 10        | 2         | 1         | 2         | 5         | 0        | 0        | 0        | 1         | 1        |
| 49                | Shadeyay | 0          | 0         | 0         | 0         | 0         | 0         | 0        | 0        | 0        | 1         | 0        |
| 50                | Shadeyay | 14         | 0         | 1         | 1         | 0         | 2         | 0        | 0        | 0        | 1         | 0        |
| <b>Clan total</b> |          | <b>43</b>  | <b>28</b> | <b>9</b>  | <b>3</b>  | <b>6</b>  | <b>18</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>5</b>  | <b>2</b> |
| 51                | Shaipay  | 8          | 4         | 2         | 0         | 1         | 3         | 0        | 0        | 0        | 1         | 1        |
| 52                | Shaipay  | 10         | 0         | 1         | 0         | 2         | 3         | 0        | 0        | 0        | *         | 0        |
| 53                | Shaipay  | 4          | 0         | 1         | 1         | 2         | 4         | 0        | 0        | 0        | 1         | 0        |
| 54                | Shaipay  | 4          | 0         | 1         | 1         | 1         | 3         | 0        | 0        | 0        | *         | 0        |
| 55                | Shaipay  | 10         | 0         | 1         | 0         | 1         | 2         | 0        | 0        | 0        | 1         | 0        |
| 56                | Shaipay  | 10         | 3         | 2         | 0         | 1         | 3         | 0        | 0        | 0        | 1         | 1        |
| 57                | Shaipay  | 10         | 0         | 3         | 1         | 2         | 6         | 0        | 0        | 1        | 1         | 0        |
| 58                | Shaipay  | 10         | 10        | 4         | 2         | 1         | 7         | 0        | 0        | 1        | 1         | 1        |
| 59                | Shaipay  | 12         | 0         | 1         | 1         | 2         | 4         | 0        | 0        | 0        | 0         | 0        |
| 60                | Shaipay  | 20         | 16        | 5         | 1         | 2         | 8         | 0        | 1        | 1        | 1         | 1        |
| 61                | Shaipay  | 8          | 0         | 2         | 0         | 1         | 3         | 0        | 0        | 0        | 1         | 0        |
| 62                | Shaipay  | 23         | 13        | 3         | 1         | 3         | 7         | 0        | 0        | 1        | 1         | 1        |
| 63                | Shaipay  | 12         | 13        | 1         | 1         | 1         | 3         | 0        | 0        | 0        | 1         | 1        |
| 64                | Shaipay  | 10         | 12        | 2         | 0         | 2         | 4         | 0        | 0        | 0        | 1         | 1        |
| 65                | Shaipay  | 18         | 3         | 2         | 1         | 2         | 5         | 0        | 1        | 0        | 1         | 1        |
| 66                | Shaipay  | 0          | 0         | 0         | 0         | 0         | 0         | 0        | 0        | 0        | 1         | 0        |
| 67                | Shaipay  | 13         | 0         | 2         | 1         | 2         | 5         | 0        | 0        | 0        | 1         | 0        |
| <b>Clan total</b> |          | <b>182</b> | <b>74</b> | <b>33</b> | <b>11</b> | <b>26</b> | <b>70</b> | <b>0</b> | <b>2</b> | <b>4</b> | <b>14</b> | <b>8</b> |
| 68                | Somalay  | 6          | 0         | 2         | 0         | 1         | 3         | 0        | 0        | 0        | 0         | 0        |
| 69                | Somalay  | 6          | 0         | 1         | 1         | 2         | 4         | 0        | 0        | 0        | 1         | 0        |
| 70                | Somalay  | 4          | 0         | 2         | 0         | 2         | 4         | 0        | 0        | 0        | 0         | 0        |
| 71                | Somalay  | 0          | 0         | 1         | 0         | 0         | 1         | 0        | 0        | 0        | 1         | 0        |
| 72                | Somalay  | 6          | 0         | 1         | 0         | 2         | 3         | 0        | 0        | 0        | *         | 0        |
| 73                | Somalay  | 4          | 4         | 3         | 1         | 0         | 4         | 0        | 0        | 1        | *         | 1        |
| 74                | Somalay  | 8          | 5         | 2         | 0         | 2         | 4         | 0        | 0        | 0        | 1         | 0        |
| 75                | Somalay  | 16         | 14        | 3         | 1         | 2         | 6         | 3        | 1        | 1        | 1         | 0        |
| 76                | Somalay  | 3          | 0         | 1         | 0         | 0         | 1         | 0        | 0        | 0        | *         | 0        |
| 77                | Somalay  | 8          | 20        | 3         | 1         | 2         | 6         | 0        | 1        | 1        | 1         | 1        |
| 78                | Somalay  | 6          | 0         | 2         | 0         | 0         | 2         | 0        | 0        | 0        | 1         | 0        |
| 79                | Somalay  | 4          | 0         | 1         | 0         | 1         | 2         | 0        | 0        | 0        | *         | 0        |
| 80                | Somalay  | 7          | 6         | 3         | 0         | 0         | 3         | 0        | 0        | 0        | 1         | 1        |
| 81                | Somalay  | 0          | 0         | 0         | 0         | 0         | 0         | 0        | 0        | 0        | *         | 0        |
| 82                | Somalay  | 0          | 0         | 1         | 0         | 0         | 1         | 0        | 0        | 1        | 1         | 0        |
| 83                | Somalay  | 6          | 7         | 3         | 1         | 1         | 5         | 0        | 0        | 1        | 1         | 1        |
| 84                | Somalay  | 10         | 0         | 2         | 1         | 1         | 4         | 0        | 0        | 0        | 1         | 0        |
| 85                | Somalay  | 6          | 0         | 2         | 1         | 1         | 4         | 0        | 0        | 0        | 1         | 1        |
| 86                | Somalay  | 3          | 5         | 3         | 1         | 2         | 6         | 0        | 0        | 0        | 1         | 1        |
| 87                | Somalay  | 3          | 0         | 1         | 0         | 2         | 3         | 0        | 0        | 0        | 1         | 0        |
| 88                | Somalay  | 6          | 0         | 2         | 0         | 1         | 3         | 0        | 0        | 0        | 1         | 0        |
| 89                | Somalay  | 2          | 0         | 1         | 1         | 0         | 2         | 0        | 0        | 0        | *         | 0        |
| 90                | Somalay  | 6          | 6         | 3         | 1         | 1         | 5         | 2        | 1        | 1        | 1         | 1        |
| 91                | Somalay  | 16         | 20        | 2         | 1         | 1         | 4         | 0        | 0        | 1        | 1         | 1        |
| 92                | Somalay  | 8          | 0         | 2         | 1         | 2         | 5         | 0        | 0        | 0        | 1         | 1        |



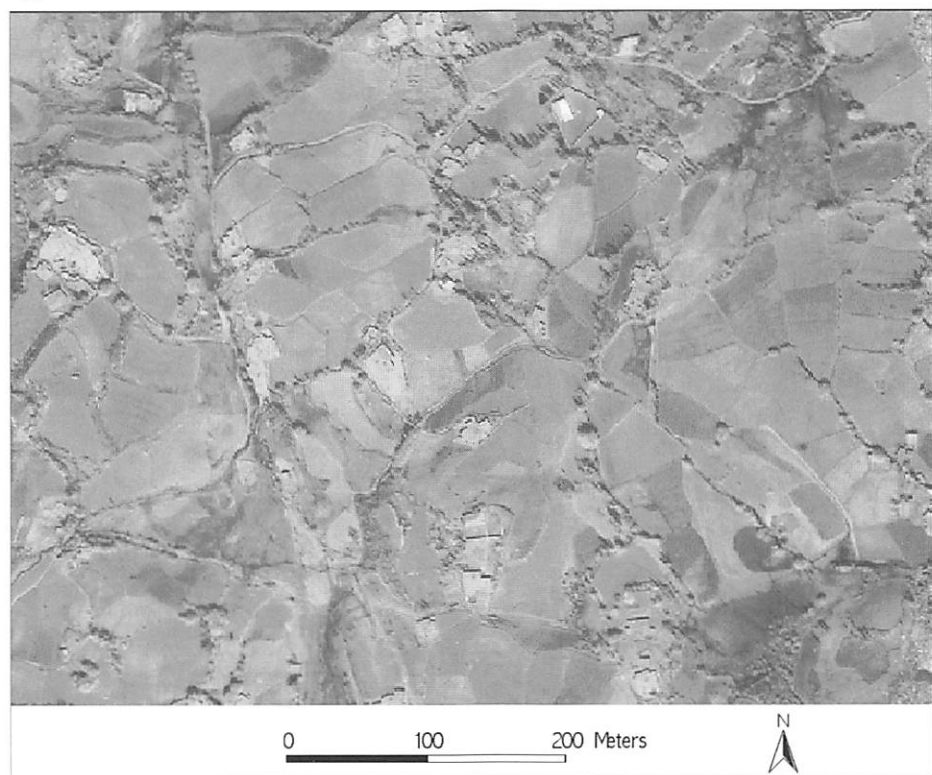
**App. 1.4 Village Odier: Household Data 2001 (3)**

|                      |         |            |            |            |           |            |            |          |          |           |           |           |
|----------------------|---------|------------|------------|------------|-----------|------------|------------|----------|----------|-----------|-----------|-----------|
| 93                   | Somalay | 7          | 16         | 2          | 1         | 2          | 5          | 0        | 1        | 1         | 1         | 1         |
| 94                   | Somalay | 0          | 0          | 1          | 0         | 0          | 1          | 0        | 0        | 0         | *         | 0         |
| 95                   | Somalay | 4          | 1          | 2          | 0         | 0          | 2          | 0        | 0        | 0         | 1         | 0         |
| 96                   | Somalay | 8          | 20         | 4          | 2         | 1          | 7          | 0        | 0        | 1         | 1         | 1         |
| 97                   | Somalay | 4          | 8          | 2          | 0         | 2          | 4          | 0        | 0        | 0         | *         | 0         |
| 98                   | Somalay | 8          | 0          | 1          | 0         | 1          | 2          | 0        | 0        | 0         | 0         | 0         |
| 99                   | Somalay | 8          | 0          | 2          | 1         | 0          | 3          | 0        | 0        | 0         | *         | 0         |
| 100                  | Somalay | 3          | 4          | 1          | 1         | 1          | 3          | 0        | 0        | 0         | 1         | 0         |
| 101                  | Somalay | 0          | 0          | 1          | 0         | 1          | 2          | 0        | 0        | 0         | 0         | 0         |
| 102                  | Somalay | 4          | 4          | 1          | 1         | 1          | 3          | 0        | 0        | 1         | 1         | 1         |
| 103                  | Somalay | 10         | 12         | 3          | 2         | 2          | 7          | 0        | 0        | 1         | 1         | 1         |
| 104                  | Somalay | 5          | 4          | 2          | 0         | 0          | 2          | 0        | 0        | 0         | *         | 0         |
| 105                  | Somalay | 10         | 5          | 4          | 2         | 0          | 6          | 0        | 0        | 0         | 1         | 1         |
| 106                  | Somalay | 5          | 0          | 1          | 1         | 2          | 4          | 0        | 0        | 0         | 1         | 0         |
| 107                  | Somalay | 6          | 0          | 2          | 2         | 2          | 6          | 0        | 0        | 0         | 1         | 0         |
| 108                  | Somalay | 7          | 0          | 1          | 1         | 0          | 2          | 0        | 0        | 0         | 1         | 0         |
| 109                  | Somalay | 7          | 0          | 1          | 0         | 1          | 2          | 0        | 0        | 0         | 1         | 0         |
| 110                  | Somalay | 4          | 0          | 1          | 0         | 1          | 2          | 0        | 0        | 0         | 1         | 0         |
| 111                  | Somalay | 14         | 14         | 3          | 1         | 2          | 6          | 0        | 0        | 0         | 1         | 1         |
| 112                  | Somalay | 4          | 8          | 1          | 1         | 1          | 3          | 0        | 1        | 0         | 1         | 1         |
| 113                  | Somalay | 4          | 5          | 2          | 1         | 0          | 3          | 0        | 0        | 0         | *         | 0         |
| 114                  | Somalay | 10         | 10         | 3          | 0         | 2          | 5          | 0        | 0        | 1         | 1         | 1         |
| 115                  | Somalay | 5          | 12         | 3          | 1         | 2          | 6          | 0        | 0        | 0         | 1         | 1         |
| 116                  | Somalay | 8          | 0          | 1          | 0         | 0          | 1          | 0        | 0        | 0         | *         | 0         |
| 117                  | Somalay | 3          | 5          | 2          | 0         | 1          | 3          | 0        | 0        | 1         | 1         | 1         |
| 118                  | Somalay | 11         | 13         | 2          | 0         | 0          | 2          | 0        | 0        | 0         | 1         | 1         |
| 119                  | Somalay | 5          | 0          | 2          | 1         | 1          | 4          | 0        | 0        | 0         | 0         | 0         |
| 120                  | Somalay | 3          | 6          | 2          | 1         | 1          | 4          | 0        | 0        | 0         | *         | 0         |
| 121                  | Somalay | 7          | 8          | 2          | 1         | 1          | 4          | 0        | 0        | 1         | 1         | 1         |
| 122                  | Somalay | 6          | 7          | 2          | 0         | 1          | 3          | 0        | 0        | 1         | 1         | 1         |
| <b>Clan total</b>    |         | <b>324</b> | <b>249</b> | <b>104</b> | <b>33</b> | <b>55</b>  | <b>192</b> | <b>5</b> | <b>5</b> | <b>15</b> | <b>37</b> | <b>22</b> |
| <b>Village total</b> |         | <b>812</b> | <b>448</b> | <b>224</b> | <b>70</b> | <b>131</b> | <b>425</b> | <b>5</b> | <b>9</b> | <b>26</b> | <b>90</b> | <b>41</b> |

\* not regular households in 1980

Source: Author's own survey 2001.

App. 2 Section of the IKONOS Satellite Image



### App. 3 Meta Data for the IKONOS Satellite Images

#### META DATA 1

##### Company Information

##### Address

Space Imaging Middle East  
Suite 408 Warba Center  
PO Box 35391

United Arab Emirates

##### Contact Information

On the Web: <http://www.spaceimagingme.com>

Customer Service Phone (World Wide): +971 4 266 1799

Customer Service Fax (World Wide): +971 4 268 9173

Customer Service Center hours of operation:

Sunday - Thursday, 0830-1900 (GMT+4)

=====

##### Product Order Metadata

Product Order Number: 69911

Customer Project Name: IK01SIME038 (East)

Product Order Area (Geographic Coordinates)

Number of Coordinates: 4

Coordinate: 1

Latitude: 36.35500000 degrees

Longitude: 72.42635399 degrees

Coordinate: 2

Latitude: 36.44900000 degrees

Longitude: 72.42635399 degrees

Coordinate: 3

Latitude: 36.44900000 degrees

Longitude: 72.55001667 degrees

Coordinate: 4

Latitude: 36.35500000 degrees

Longitude: 72.55001667 degrees

Product Order Area (Map Coordinates)

Coordinate: 1

Map X (Easting): 269064.17 meters

Map Y (Northing): 4026400.09 meters

Coordinate: 2

Map X (Easting): 269342.38 meters

Map Y (Northing): 4036829.90 meters

Coordinate: 3

Map X (Easting): 280427.44 meters

Map Y (Northing): 4036541.00 meters

Coordinate: 4

Map X (Easting): 280162.62 meters

Map Y (Northing): 4026111.48 meters

Sensor Type: Satellite

Processing Level: Standard Geometrically Corrected

Image Type: PAN

Interpolator Method: Bicubic

Multispectral Algorithm: None

Stereo: Mono

Mosaic: No

Map Projection: Universal Transverse Mercator

UTM Specific Parameters

Hemisphere: N

Zone Number: 43

Datum: WGS84

Product Order Pixel Size: 1.00 meters

MTFC Applied: Yes

DRA Applied: No

Media: CD

File Format: GeoTIFF

TIFF Tiled: No

Bits per Pixel per Band: 11 bits per pixel

Special Instructions: NA

=====

Acquired Nominal GSD

Cross Scan: 0.84 meters

Along Scan: 0.87 meters

Scan Direction: 0 degrees

Nominal Collection Azimuth: 356.0939 degrees

Nominal Collection Elevation: 75.70151 degrees

Sun Angle Azimuth: 141.4871 degrees

Sun Angle Elevation: 63.35995 degrees

Acquisition Date/Time: 2001-04-28 06:00

=====

##### Product Space Metadata

Number of Image Tiles: 1

X Tiles: 1

Y Tiles: 1

Product MBR Geographic Coordinates

Number of Coordinates: 4

Coordinate: 1

Latitude: 36.44893305 degrees

Longitude: 72.42325255 degrees

Coordinate: 2

Latitude: 36.45160207 degrees

Longitude: 72.54993172 degrees

Coordinate: 3

Latitude: 36.35505517 degrees

Longitude: 72.55296265 degrees

Coordinate: 4

Latitude: 36.35239549 degrees

Longitude: 72.42643978 degrees

Product Map Coordinates

UL Map X (Easting): 269064.17 meters

UL Map Y (Northing): 4036829.90 meters

Pixel Size X: 1.00 meters

Pixel Size Y: 1.00 meters

Columns: 11364 pixels

Rows: 10720 pixels

=====

##### Product Component Metadata

Number of Components: 1

Tile ID: 0000000

Product Image ID: 000

Tile File Name: po\_69911\_pan\_0000000.tif

Tile Geographic Corner Coordinates

Number of Coordinates: 4

Coordinate: 1

Latitude: 36.44893305 degrees

Longitude: 72.42325255 degrees

Coordinate: 2

Latitude: 36.45160207 degrees

Longitude: 72.54993172 degrees

Coordinate: 3

Latitude: 36.35505517 degrees

Longitude: 72.55296265 degrees

Coordinate: 4

Latitude: 36.35239549 degrees

Longitude: 72.42643978 degrees

Tile Map Coordinates

UL Map X (Easting): 269064.17 meters

UL Map Y (Northing): 4036829.90 meters

Pixel Size X: 1.00 meters

Pixel Size Y: 1.00 meters

Columns: 11364 pixels

Rows: 10720 pixels

##### Source Image Metadata

Number of Source Images: 1

Source Image ID: 2001042806005320000011632430

Product Image ID: 000

Sensor: IKONOS-2

### App. 4.1 Village Odier: Land Use and Land Ownership 2001 (1)

Appendix 4: Land use statistics 2001 (Land Holding Status and Location of cultivated land)

| Household characteristics |          |                            |             | Land holding status (acres) |              |             |                       | Location of the arable land |              |              |             |
|---------------------------|----------|----------------------------|-------------|-----------------------------|--------------|-------------|-----------------------|-----------------------------|--------------|--------------|-------------|
| Hh                        | Clan     | Cultivated area per person | Gift hiba   | Inherited                   | Purchased    | Rented      | Total cultivated land | Lower Odier                 | Upper Odier  | Romolashit   | Nash-tani   |
| 1                         | Bulay    | 0.69                       | 0.00        | 1.22                        | 0.16         | 0.00        | 1.38                  | 0.73                        | 0.00         | 0.65         | 0.00        |
| 2                         | Bulay    | 0.86                       | 0.00        | 4.01                        | 1.20         | 0.78        | 5.99                  | 0.00                        | 4.36         | 1.63         | 0.00        |
| 3                         | Bulay    | 0.34                       | 0.00        | 1.36                        | 0.00         | 0.71        | 2.07                  | 0.08                        | 1.76         | 0.23         | 0.00        |
| 4                         | Bulay    | 0.33                       | 0.00        | 2.33                        | 0.00         | 0.00        | 2.33                  | 1.78                        | 0.00         | 0.55         | 0.00        |
| 5                         | Bulay    | 0.27                       | 0.00        | 1.06                        | 0.00         | 0.00        | 1.06                  | 0.42                        | 0.00         | 0.64         | 0.00        |
| 6                         | Bulay    | 1.44                       | 0.00        | 2.88                        | 0.00         | 0.00        | 2.88                  | 0.00                        | 2.03         | 0.85         | 0.00        |
| 7                         | Bulay    | 0.37                       | 0.00        | 3.15                        | 0.14         | 0.00        | 3.29                  | 0.18                        | 1.43         | 1.68         | 0.00        |
| 8                         | Bulay    | 0.22                       | 0.00        | 0.74                        | 0.15         | 0.00        | 0.88                  | 0.39                        | 0.00         | 0.50         | 0.00        |
| 9                         | Bulay    | 0.44                       | 0.74        | 2.22                        | 0.00         | 1.43        | 4.39                  | 1.77                        | 1.43         | 1.20         | 0.00        |
| 10                        | Bulay    | 0.29                       | 0.00        | 0.56                        | 0.62         | 0.00        | 1.18                  | 0.36                        | 0.00         | 0.82         | 0.00        |
| 11                        | Bulay    | 0.22                       | 0.00        | 0.54                        | 1.23         | 0.00        | 1.77                  | 0.40                        | 1.15         | 0.22         | 0.00        |
| 12                        | Bulay    | 0.28                       | 0.00        | 0.89                        | 2.80         | 0.00        | 3.68                  | 0.41                        | 1.71         | 1.57         | 0.00        |
| 13                        | Bulay    | 0.20                       | 0.00        | 1.24                        | 0.00         | 0.52        | 1.76                  | 0.36                        | 0.00         | 1.40         | 0.00        |
| 14                        | Bulay    | 0.36                       | 0.00        | 1.13                        | 1.41         | 0.00        | 2.54                  | 1.59                        | 0.00         | 0.95         | 0.00        |
| 15                        | Bulay    | 0.14                       | 0.00        | 1.10                        | 0.00         | 0.00        | 1.10                  | 0.00                        | 1.10         | 0.00         | 0.00        |
| 16                        | Bulay    | 0.28                       | 0.00        | 0.52                        | 1.41         | 1.18        | 3.10                  | 0.21                        | 2.89         | 0.00         | 0.00        |
| 17                        | Bulay    | 0.14                       | 0.00        | 0.71                        | 0.00         | 0.00        | 0.71                  | 0.00                        | 0.71         | 0.00         | 0.00        |
| 18                        | Bulay    | 0.23                       | 0.00        | 1.14                        | 0.00         | 0.00        | 1.14                  | 0.00                        | 1.14         | 0.00         | 0.00        |
| 19                        | Bulay    | 0.24                       | 0.00        | 1.40                        | 0.95         | 0.83        | 3.18                  | 0.00                        | 2.74         | 0.44         | 0.00        |
| 20                        | Bulay    | 0.98                       | 0.00        | 1.89                        | 0.96         | 1.09        | 3.94                  | 0.00                        | 3.94         | 0.00         | 0.00        |
| 21                        | Bulay    | 0.31                       | 0.00        | 3.39                        | 0.00         | 0.00        | 3.39                  | 0.00                        | 1.91         | 1.47         | 0.00        |
| 22                        | Bulay    | 0.51                       | 0.00        | 0.59                        | 1.47         | 0.00        | 2.06                  | 2.06                        | 0.00         | 0.00         | 0.00        |
| 23                        | Bulay    | 0.19                       | 0.00        | 1.55                        | 0.19         | 0.16        | 1.90                  | 0.00                        | 1.90         | 0.00         | 0.00        |
| 24                        | Bulay    | 0.25                       | 1.54        | 0.41                        | 0.32         | 0.00        | 2.28                  | 0.00                        | 1.86         | 0.41         | 0.00        |
| 25                        | Bulay    | 0.15                       | 0.00        | 0.00                        | 1.06         | 0.00        | 1.06                  | 0.00                        | 1.06         | 0.00         | 0.00        |
| 26                        | Bulay    | 0.23                       | 0.58        | 2.78                        | 0.00         | 0.59        | 3.94                  | 2.30                        | 0.81         | 0.83         | 0.00        |
| 27                        | Bulay    | 0.70                       | 0.00        | 2.79                        | 0.00         | 0.00        | 2.79                  | 0.29                        | 0.69         | 1.81         | 0.00        |
| 28                        | Bulay    | 0.15                       | 0.00        | 1.69                        | 0.00         | 0.00        | 1.69                  | 0.00                        | 1.00         | 0.69         | 0.00        |
| 29                        | Bulay    | 0.12                       | 0.00        | 2.11                        | 0.00         | 0.00        | 2.11                  | 0.92                        | 0.00         | 1.19         | 0.00        |
| 30                        | Bulay    | 0.12                       | 0.00        | 1.07                        | 0.00         | 0.00        | 1.07                  | 0.28                        | 0.00         | 0.78         | 0.00        |
| 31                        | Bulay    | 0.18                       | 0.27        | 0.81                        | 0.00         | 0.00        | 1.08                  | 0.72                        | 0.00         | 0.36         | 0.00        |
| <b>Clan total</b>         |          | <b>0.30</b>                | <b>3.13</b> | <b>47.24</b>                | <b>14.05</b> | <b>7.28</b> | <b>71.71</b>          | <b>15.26</b>                | <b>35.61</b> | <b>20.84</b> | <b>0.00</b> |
| 32                        | Khushay  | 0.08                       | 0.00        | 0.48                        | 0.00         | 0.00        | 0.48                  | 0.48                        | 0.00         | 0.00         | 0.00        |
| 33                        | Khushay  | 0.05                       | 0.00        | 0.44                        | 0.00         | 0.00        | 0.44                  | 0.44                        | 0.00         | 0.00         | 0.00        |
| 34                        | Khushay  | 0.06                       | 0.00        | 0.89                        | 0.00         | 0.00        | 0.89                  | 0.89                        | 0.00         | 0.00         | 0.00        |
| <b>Clan total</b>         |          | <b>0.06</b>                | <b>0.00</b> | <b>1.82</b>                 | <b>0.00</b>  | <b>0.00</b> | <b>1.82</b>           | <b>1.82</b>                 | <b>0.00</b>  | <b>0.00</b>  | <b>0.00</b> |
| 35                        | Nasketek | 0.14                       | 0.00        | 0.98                        | 0.00         | 0.54        | 1.52                  | 1.14                        | 0.39         | 0.00         | 0.00        |
| 36                        | Nasketek | 0.24                       | 0.00        | 1.42                        | 0.00         | 0.00        | 1.42                  | 0.98                        | 0.00         | 0.44         | 0.00        |
| 37                        | Nasketek | 0.13                       | 0.00        | 1.33                        | 0.21         | 0.00        | 1.54                  | 1.54                        | 0.00         | 0.00         | 0.00        |
| 38                        | Nasketek | 0.17                       | 0.00        | 0.91                        | 1.77         | 0.00        | 2.68                  | 0.97                        | 1.71         | 0.00         | 0.00        |
| 39                        | Nasketek | 0.12                       | 0.00        | 1.55                        | 0.00         | 0.00        | 1.55                  | 0.86                        | 0.69         | 0.00         | 0.00        |
| 40                        | Nasketek | 0.11                       | 0.00        | 0.54                        | 0.00         | 0.00        | 0.54                  | 0.20                        | 0.34         | 0.00         | 0.00        |
| 41                        | Nasketek | 0.07                       | 0.00        | 0.35                        | 0.00         | 0.00        | 0.35                  | 0.08                        | 0.27         | 0.00         | 0.00        |
| 42                        | Nasketek | 0.31                       | 0.00        | 1.12                        | 1.33         | 0.00        | 2.46                  | 2.15                        | 0.00         | 0.30         | 0.00        |
| 43                        | Nasketek | 0.21                       | 0.00        | 0.69                        | 0.56         | 0.00        | 1.25                  | 0.28                        | 0.96         | 0.00         | 0.00        |



**App. 4.1 Village Odier: Land Use and Land Ownership 2001 (3)**

|                      |         |             |             |               |              |              |               |              |               |              |              |
|----------------------|---------|-------------|-------------|---------------|--------------|--------------|---------------|--------------|---------------|--------------|--------------|
| 91                   | Somalay | 0.24        | 0.00        | 4.20          | 0.92         | 0.00         | 5.12          | 0.79         | 0.92          | 2.91         | 0.50         |
| 92                   | Somalay | 1.26        | 0.00        | 1.80          | 1.18         | 2.06         | 5.04          | 0.00         | 3.14          | 1.46         | 0.44         |
| 93                   | Somalay | 0.06        | 0.00        | 0.68          | 0.00         | 0.18         | 0.85          | 0.42         | 0.00          | 0.43         | 0.00         |
| 94                   | Somalay | 0.17        | 0.00        | 0.93          | 0.10         | 0.00         | 1.03          | 0.00         | 0.64          | 0.25         | 0.14         |
| 95                   | Somalay | 0.18        | 0.00        | 2.40          | 0.62         | 0.00         | 3.03          | 1.58         | 0.25          | 0.79         | 0.41         |
| 96                   | Somalay | 0.06        | 0.34        | 0.00          | 0.00         | 0.00         | 0.34          | 0.00         | 0.34          | 0.00         | 0.00         |
| 97                   | Somalay | 0.15        | 0.00        | 0.89          | 0.00         | 0.00         | 0.89          | 0.00         | 0.18          | 0.12         | 0.59         |
| 98                   | Somalay | 0.44        | 0.68        | 6.97          | 3.26         | 0.00         | 10.92         | 0.00         | 2.43          | 6.17         | 2.32         |
| 99                   | Somalay | 0.21        | 0.00        | 1.44          | 0.00         | 0.00         | 1.44          | 0.24         | 0.00          | 1.21         | 0.00         |
| 100                  | Somalay | 0.34        | 0.00        | 2.02          | 0.00         | 0.00         | 2.02          | 0.00         | 0.63          | 0.88         | 0.50         |
| 101                  | Somalay | 0.06        | 0.00        | 0.00          | 0.56         | 0.00         | 0.56          | 0.00         | 0.56          | 0.00         | 0.00         |
| 102                  | Somalay | 0.18        | 1.09        | 1.13          | 0.09         | 0.00         | 2.31          | 0.00         | 1.65          | 0.19         | 0.48         |
| 103                  | Somalay | 0.92        | 0.00        | 6.73          | 1.56         | 0.00         | 8.29          | 0.74         | 4.93          | 2.13         | 0.49         |
| 104                  | Somalay | 0.73        | 0.00        | 3.17          | 0.50         | 0.00         | 3.66          | 0.00         | 1.07          | 2.59         | 0.00         |
| 105                  | Somalay | 0.23        | 0.00        | 3.86          | 0.00         | 0.00         | 3.86          | 0.00         | 1.22          | 1.81         | 0.84         |
| 106                  | Somalay | 0.55        | 0.00        | 1.26          | 0.00         | 1.48         | 2.74          | 1.62         | 0.00          | 1.12         | 0.00         |
| 107                  | Somalay | 0.20        | 0.00        | 1.38          | 0.00         | 0.00         | 1.38          | 0.00         | 0.59          | 0.79         | 0.00         |
| 108                  | Somalay | 0.13        | 0.00        | 0.90          | 0.00         | 0.00         | 0.90          | 0.23         | 0.00          | 0.00         | 0.67         |
| 109                  | Somalay | 0.22        | 0.00        | 0.88          | 0.00         | 0.00         | 0.88          | 0.41         | 0.00          | 0.00         | 0.47         |
| 110                  | Somalay | 1.00        | 0.00        | 1.99          | 0.00         | 0.00         | 1.99          | 0.44         | 0.96          | 0.00         | 0.59         |
| 111                  | Somalay | 0.23        | 0.00        | 3.31          | 0.43         | 0.00         | 3.74          | 0.97         | 1.05          | 0.43         | 1.30         |
| 112                  | Somalay | 0.30        | 0.00        | 1.49          | 0.00         | 0.00         | 1.49          | 0.00         | 0.87          | 0.00         | 0.63         |
| 113                  | Somalay | 0.16        | 0.00        | 0.93          | 0.00         | 0.00         | 0.93          | 0.00         | 0.51          | 0.00         | 0.42         |
| 114                  | Somalay | 0.34        | 0.00        | 1.95          | 0.77         | 0.70         | 3.42          | 0.00         | 1.53          | 1.88         | 0.00         |
| 115                  | Somalay | 0.60        | 0.00        | 3.65          | 1.14         | 0.00         | 4.79          | 0.00         | 3.14          | 1.57         | 0.08         |
| 116                  | Somalay | 0.15        | 0.00        | 0.24          | 0.95         | 0.00         | 1.19          | 0.00         | 0.69          | 0.50         | 0.00         |
| 117                  | Somalay | 0.15        | 0.00        | 1.38          | 0.00         | 0.00         | 1.38          | 0.43         | 0.00          | 0.94         | 0.00         |
| 118                  | Somalay | 0.33        | 0.00        | 3.41          | 0.00         | 0.53         | 3.94          | 0.80         | 0.00          | 3.14         | 0.00         |
| 119                  | Somalay | 0.08        | 0.00        | 0.49          | 0.19         | 0.00         | 0.68          | 0.00         | 0.05          | 0.63         | 0.00         |
| 120                  | Somalay | 0.25        | 0.00        | 2.51          | 0.51         | 0.00         | 3.02          | 0.00         | 0.98          | 0.54         | 1.50         |
| 121                  | Somalay | 0.28        | 0.00        | 3.23          | 0.13         | 0.00         | 3.35          | 0.93         | 0.57          | 0.88         | 0.97         |
| 122                  | Somalay | 0.10        | 0.00        | 0.25          | 0.66         | 0.00         | 0.91          | 0.00         | 0.07          | 0.85         | 0.00         |
| <b>Clan total</b>    |         | <b>0.25</b> | <b>2.11</b> | <b>101.81</b> | <b>18.95</b> | <b>8.61</b>  | <b>131.49</b> | <b>16.74</b> | <b>45.59</b>  | <b>48.39</b> | <b>20.78</b> |
| <b>Village total</b> |         | <b>0.24</b> | <b>6.33</b> | <b>194.29</b> | <b>43.82</b> | <b>20.33</b> | <b>264.77</b> | <b>55.60</b> | <b>106.72</b> | <b>81.68</b> | <b>20.78</b> |

## App. 4.2 Village Odier: Land Use and Land Ownership 2001 (1)

Appendix 4: Land use Statistics 2001 (Cropping Pattern)

| Hh                | Clan     | Barley       | Fallow       | Fallow / potato | Lucerne      | Maize       | Maize / potato | Potato      | Spring wheat | Winter wheat | Others      |
|-------------------|----------|--------------|--------------|-----------------|--------------|-------------|----------------|-------------|--------------|--------------|-------------|
| 1                 | Bulay    | 0.52         | 0.00         | 0.00            | 0.58         | 0.13        | 0.00           | 0.00        | 0.00         | 0.15         | 0.00        |
| 2                 | Bulay    | 1.13         | 1.68         | 0.00            | 1.52         | 0.03        | 0.34           | 0.00        | 0.54         | 0.75         | 0.00        |
| 3                 | Bulay    | 0.76         | 0.71         | 0.00            | 0.47         | 0.00        | 0.00           | 0.00        | 0.13         | 0.00         | 0.00        |
| 4                 | Bulay    | 0.41         | 0.34         | 0.00            | 0.35         | 0.00        | 0.54           | 0.00        | 0.00         | 0.59         | 0.10        |
| 5                 | Bulay    | 0.30         | 0.23         | 0.14            | 0.29         | 0.00        | 0.00           | 0.00        | 0.00         | 0.11         | 0.00        |
| 6                 | Bulay    | 0.23         | 1.13         | 0.00            | 0.28         | 0.00        | 0.22           | 0.00        | 1.02         | 0.00         | 0.00        |
| 7                 | Bulay    | 0.47         | 1.19         | 0.00            | 1.43         | 0.00        | 0.00           | 0.00        | 0.20         | 0.00         | 0.00        |
| 8                 | Bulay    | 0.52         | 0.00         | 0.00            | 0.15         | 0.00        | 0.00           | 0.00        | 0.00         | 0.22         | 0.00        |
| 9                 | Bulay    | 1.00         | 1.45         | 0.00            | 0.08         | 0.00        | 0.00           | 0.00        | 1.45         | 0.42         | 0.00        |
| 10                | Bulay    | 0.16         | 0.41         | 0.00            | 0.21         | 0.00        | 0.09           | 0.00        | 0.20         | 0.11         | 0.00        |
| 11                | Bulay    | 0.54         | 0.43         | 0.00            | 0.44         | 0.00        | 0.22           | 0.00        | 0.00         | 0.14         | 0.00        |
| 12                | Bulay    | 0.54         | 0.00         | 0.70            | 1.80         | 0.00        | 0.00           | 0.00        | 0.00         | 0.64         | 0.00        |
| 13                | Bulay    | 0.11         | 0.21         | 0.00            | 1.08         | 0.00        | 0.13           | 0.00        | 0.00         | 0.24         | 0.00        |
| 14                | Bulay    | 0.40         | 0.27         | 0.00            | 0.85         | 0.00        | 0.60           | 0.00        | 0.00         | 0.43         | 0.00        |
| 15                | Bulay    | 0.00         | 0.23         | 0.17            | 0.00         | 0.00        | 0.00           | 0.00        | 0.34         | 0.37         | 0.00        |
| 16                | Bulay    | 0.90         | 0.00         | 0.00            | 0.99         | 0.40        | 0.32           | 0.00        | 0.28         | 0.21         | 0.00        |
| 17                | Bulay    | 0.18         | 0.00         | 0.19            | 0.00         | 0.00        | 0.00           | 0.00        | 0.00         | 0.34         | 0.00        |
| 18                | Bulay    | 0.24         | 0.30         | 0.00            | 0.00         | 0.00        | 0.37           | 0.00        | 0.00         | 0.23         | 0.00        |
| 19                | Bulay    | 0.67         | 0.54         | 0.00            | 0.90         | 0.00        | 0.00           | 0.08        | 0.26         | 0.43         | 0.29        |
| 20                | Bulay    | 1.49         | 1.68         | 0.00            | 0.41         | 0.00        | 0.00           | 0.00        | 0.00         | 0.37         | 0.00        |
| 21                | Bulay    | 0.43         | 1.08         | 0.00            | 0.00         | 0.00        | 0.15           | 0.15        | 1.35         | 0.14         | 0.10        |
| 22                | Bulay    | 0.29         | 0.22         | 0.00            | 0.24         | 0.00        | 0.26           | 0.00        | 0.00         | 1.04         | 0.00        |
| 23                | Bulay    | 0.16         | 0.72         | 0.00            | 0.41         | 0.00        | 0.37           | 0.00        | 0.25         | 0.00         | 0.00        |
| 24                | Bulay    | 0.47         | 0.43         | 0.00            | 0.51         | 0.24        | 0.00           | 0.00        | 0.23         | 0.41         | 0.00        |
| 25                | Bulay    | 0.40         | 0.27         | 0.00            | 0.00         | 0.00        | 0.00           | 0.00        | 0.21         | 0.18         | 0.00        |
| 26                | Bulay    | 0.97         | 0.99         | 0.00            | 0.25         | 0.00        | 0.29           | 0.17        | 0.42         | 0.86         | 0.00        |
| 27                | Bulay    | 0.69         | 0.44         | 0.00            | 0.93         | 0.00        | 0.00           | 0.29        | 0.33         | 0.12         | 0.00        |
| 28                | Bulay    | 0.00         | 0.95         | 0.00            | 0.09         | 0.00        | 0.20           | 0.00        | 0.24         | 0.21         | 0.00        |
| 29                | Bulay    | 0.12         | 0.29         | 0.00            | 0.79         | 0.00        | 0.45           | 0.00        | 0.00         | 0.47         | 0.00        |
| 30                | Bulay    | 0.09         | 0.69         | 0.00            | 0.00         | 0.15        | 0.00           | 0.00        | 0.00         | 0.14         | 0.00        |
| 31                | Bulay    | 0.23         | 0.11         | 0.00            | 0.25         | 0.00        | 0.00           | 0.00        | 0.00         | 0.49         | 0.00        |
| <b>Clan total</b> |          | <b>14.41</b> | <b>16.98</b> | <b>1.19</b>     | <b>15.25</b> | <b>0.94</b> | <b>4.54</b>    | <b>0.69</b> | <b>7.44</b>  | <b>9.78</b>  | <b>0.49</b> |
| 32                | Khushay  | 0.24         | 0.00         | 0.00            | 0.00         | 0.00        | 0.00           | 0.00        | 0.00         | 0.24         | 0.00        |
| 33                | Khushay  | 0.00         | 0.00         | 0.00            | 0.00         | 0.25        | 0.00           | 0.00        | 0.00         | 0.20         | 0.00        |
| 34                | Khushay  | 0.22         | 0.00         | 0.00            | 0.00         | 0.00        | 0.00           | 0.00        | 0.21         | 0.47         | 0.00        |
| <b>Clan total</b> |          | <b>0.46</b>  | <b>0.00</b>  | <b>0.00</b>     | <b>0.00</b>  | <b>0.25</b> | <b>0.00</b>    | <b>0.00</b> | <b>0.21</b>  | <b>0.91</b>  | <b>0.00</b> |
| 35                | Nasketek | 0.18         | 0.12         | 0.00            | 0.11         | 0.19        | 0.00           | 0.00        | 0.54         | 0.38         | 0.00        |
| 36                | Nasketek | 0.00         | 0.44         | 0.00            | 0.35         | 0.00        | 0.13           | 0.00        | 0.17         | 0.32         | 0.00        |
| 37                | Nasketek | 0.48         | 0.00         | 0.00            | 0.17         | 0.00        | 0.39           | 0.00        | 0.00         | 0.49         | 0.00        |
| 38                | Nasketek | 0.44         | 0.61         | 0.00            | 0.48         | 0.00        | 0.14           | 0.00        | 0.25         | 0.71         | 0.05        |
| 39                | Nasketek | 0.34         | 0.19         | 0.00            | 0.00         | 0.13        | 0.00           | 0.00        | 0.00         | 0.89         | 0.00        |
| 40                | Nasketek | 0.00         | 0.00         | 0.00            | 0.00         | 0.00        | 0.34           | 0.00        | 0.20         | 0.00         | 0.00        |
| 41                | Nasketek | 0.27         | 0.00         | 0.00            | 0.08         | 0.00        | 0.00           | 0.00        | 0.00         | 0.00         | 0.00        |
| 42                | Nasketek | 0.43         | 0.38         | 0.00            | 0.61         | 0.00        | 0.49           | 0.00        | 0.00         | 0.55         | 0.00        |
| 43                | Nasketek | 0.19         | 0.40         | 0.00            | 0.18         | 0.00        | 0.11           | 0.00        | 0.00         | 0.36         | 0.00        |
| 44                | Nasketek | 0.35         | 1.08         | 0.00            | 0.00         | 0.16        | 0.00           | 0.00        | 0.00         | 0.28         | 0.05        |
| <b>Clan total</b> |          | <b>2.68</b>  | <b>3.21</b>  | <b>0.00</b>     | <b>1.98</b>  | <b>0.47</b> | <b>1.61</b>    | <b>0.00</b> | <b>1.17</b>  | <b>3.98</b>  | <b>0.11</b> |

**App. 4.2 Village Odier: Land Use and Land Ownership 2001 (2)**

|                   |             |             |             |             |             |             |             |             |             |             |
|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 45 Shadayay       | 0.38        | 0.00        | 0.73        | 0.45        | 0.00        | 0.00        | 0.00        | 0.00        | 0.41        | 0.00        |
| 46 Shadayay       | 0.22        | 0.00        | 0.00        | 0.00        | 0.00        | 0.23        | 0.00        | 0.00        | 0.26        | 0.00        |
| 47 Shadayay       | 0.18        | 0.15        | 0.39        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.25        | 0.00        |
| 48 Shadayay       | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.45        | 0.00        |
| 49 Shadayay       | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.33        | 0.00        | 0.00        |
| 50 Shadayay       | 0.65        | 0.00        | 0.00        | 0.21        | 0.00        | 0.30        | 0.00        | 0.00        | 0.49        | 0.00        |
| <b>Clan total</b> | <b>1.43</b> | <b>0.15</b> | <b>1.12</b> | <b>0.66</b> | <b>0.00</b> | <b>0.53</b> | <b>0.00</b> | <b>0.33</b> | <b>1.86</b> | <b>0.00</b> |
| 51 Shaipay        | 0.20        | 0.48        | 0.00        | 1.29        | 0.00        | 0.00        | 0.00        | 0.37        | 0.00        | 0.09        |
| 52 Shaipay        | 0.18        | 0.00        | 0.00        | 0.00        | 0.00        | 0.15        | 0.06        | 0.00        | 0.57        | 0.00        |
| 53 Shaipay        | 0.18        | 0.27        | 0.00        | 0.09        | 0.00        | 0.00        | 0.00        | 0.17        | 0.00        | 0.00        |
| 54 Shaipay        | 0.37        | 0.26        | 0.00        | 0.00        | 0.00        | 0.31        | 0.00        | 0.21        | 0.22        | 0.00        |
| 55 Shaipay        | 0.37        | 0.49        | 0.00        | 0.30        | 0.18        | 0.00        | 0.00        | 0.15        | 0.00        | 0.00        |
| 56 Shaipay        | 0.50        | 0.28        | 0.00        | 0.94        | 0.00        | 0.16        | 0.00        | 0.43        | 0.25        | 0.00        |
| 57 Shaipay        | 0.62        | 0.37        | 0.00        | 0.08        | 0.52        | 0.00        | 0.00        | 0.25        | 0.21        | 0.00        |
| 58 Shaipay        | 1.02        | 1.69        | 0.00        | 1.15        | 0.16        | 0.00        | 0.09        | 0.25        | 0.90        | 0.17        |
| 59 Shaipay        | 0.41        | 0.11        | 0.10        | 0.17        | 0.27        | 0.00        | 0.08        | 0.00        | 0.31        | 0.00        |
| 60 Shaipay        | 0.72        | 1.00        | 0.00        | 0.80        | 0.00        | 0.50        | 0.00        | 1.88        | 0.42        | 0.18        |
| 61 Shaipay        | 0.25        | 0.00        | 0.00        | 0.08        | 0.00        | 0.31        | 0.00        | 0.20        | 0.00        | 0.00        |
| 62 Shaipay        | 0.16        | 0.80        | 0.00        | 0.71        | 0.25        | 0.45        | 0.00        | 1.10        | 0.64        | 0.00        |
| 63 Shaipay        | 0.79        | 0.63        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.32        | 0.27        | 0.00        |
| 64 Shaipay        | 0.48        | 0.20        | 0.00        | 0.57        | 0.00        | 0.19        | 0.00        | 0.15        | 0.24        | 0.14        |
| 65 Shaipay        | 0.23        | 0.68        | 0.00        | 0.28        | 0.00        | 0.00        | 0.00        | 0.10        | 0.94        | 0.22        |
| 66 Shaipay        | 0.00        | 0.00        | 0.00        | 0.59        | 0.00        | 0.28        | 0.00        | 0.00        | 0.00        | 0.00        |
| 67 Shaipay        | 0.40        | 0.19        | 0.00        | 0.80        | 0.00        | 0.24        | 0.00        | 0.23        | 0.41        | 0.00        |
| <b>Clan total</b> | <b>6.90</b> | <b>7.45</b> | <b>0.10</b> | <b>7.84</b> | <b>1.38</b> | <b>2.59</b> | <b>0.23</b> | <b>5.82</b> | <b>5.37</b> | <b>0.80</b> |
| 68 Somalay        | 0.20        | 0.52        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.20        | 0.04        | 0.00        |
| 69 Somalay        | 0.92        | 0.06        | 0.00        | 0.39        | 0.00        | 0.30        | 0.00        | 0.00        | 0.17        | 0.00        |
| 70 Somalay        | 0.38        | 0.42        | 0.00        | 0.17        | 0.00        | 0.00        | 0.00        | 0.70        | 0.26        | 0.00        |
| 71 Somalay        | 0.10        | 0.00        | 0.00        | 0.43        | 0.00        | 0.00        | 0.00        | 0.12        | 0.00        | 0.00        |
| 72 Somalay        | 0.24        | 0.12        | 0.11        | 0.13        | 0.00        | 0.09        | 0.00        | 0.11        | 0.00        | 0.00        |
| 73 Somalay        | 0.23        | 0.50        | 0.00        | 0.41        | 0.00        | 0.22        | 0.00        | 0.43        | 0.08        | 0.00        |
| 74 Somalay        | 0.21        | 0.85        | 0.00        | 0.21        | 0.00        | 0.00        | 0.06        | 0.00        | 0.64        | 0.00        |
| 75 Somalay        | 1.51        | 1.53        | 0.00        | 0.49        | 0.00        | 0.00        | 0.00        | 0.24        | 0.67        | 0.00        |
| 76 Somalay        | 0.00        | 0.17        | 0.00        | 0.00        | 0.08        | 0.00        | 0.00        | 0.26        | 0.00        | 0.00        |
| 77 Somalay        | 0.65        | 0.43        | 0.66        | 0.85        | 0.00        | 0.00        | 0.00        | 0.66        | 0.49        | 0.00        |
| 78 Somalay        | 0.50        | 0.23        | 0.00        | 0.12        | 0.00        | 0.14        | 0.00        | 0.00        | 0.45        | 0.00        |
| 79 Somalay        | 0.30        | 0.54        | 0.00        | 0.00        | 0.10        | 0.00        | 0.00        | 0.13        | 0.00        | 0.00        |
| 80 Somalay        | 0.43        | 0.37        | 0.00        | 0.00        | 0.00        | 0.32        | 0.00        | 0.00        | 0.00        | 0.00        |
| 81 Somalay        | 0.00        | 0.12        | 0.00        | 0.14        | 0.00        | 0.00        | 0.00        | 0.00        | 0.08        | 0.00        |
| 82 Somalay        | 0.17        | 0.64        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        |
| 83 Somalay        | 0.95        | 0.55        | 0.87        | 3.23        | 0.00        | 0.00        | 0.00        | 0.65        | 0.00        | 0.00        |
| 84 Somalay        | 0.58        | 0.43        | 0.00        | 0.65        | 0.20        | 0.17        | 0.00        | 0.26        | 0.69        | 0.00        |
| 85 Somalay        | 0.61        | 0.00        | 0.00        | 0.84        | 0.00        | 0.51        | 0.00        | 0.00        | 0.00        | 0.00        |
| 86 Somalay        | 0.89        | 1.21        | 0.36        | 1.36        | 0.00        | 0.00        | 0.00        | 0.00        | 0.93        | 0.00        |
| 87 Somalay        | 0.35        | 0.00        | 0.00        | 0.00        | 0.35        | 0.00        | 0.11        | 0.54        | 0.00        | 0.00        |
| 88 Somalay        | 0.15        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.87        | 0.00        |
| 89 Somalay        | 0.16        | 0.00        | 0.15        | 0.00        | 0.00        | 0.00        | 0.00        | 0.17        | 0.11        | 0.00        |
| 90 Somalay        | 0.91        | 0.69        | 0.33        | 0.60        | 0.00        | 0.00        | 0.00        | 0.00        | 0.52        | 0.00        |
| 91 Somalay        | 0.59        | 1.95        | 0.38        | 1.57        | 0.00        | 0.00        | 0.00        | 0.43        | 0.20        | 0.00        |
| 92 Somalay        | 0.42        | 1.35        | 0.42        | 0.72        | 0.00        | 0.07        | 0.00        | 0.47        | 1.59        | 0.00        |



#### App. 4.2 Village Odier: Land Use and Land Ownership 2001 (3)

|                      |              |              |             |              |             |              |             |              |              |             |
|----------------------|--------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|--------------|-------------|
| 93 Somalay           | 0.25         | 0.24         | 0.00        | 0.20         | 0.00        | 0.18         | 0.00        | 0.00         | 0.00         | 0.00        |
| 94 Somalay           | 0.19         | 0.29         | 0.00        | 0.00         | 0.00        | 0.00         | 0.00        | 0.25         | 0.30         | 0.00        |
| 95 Somalay           | 0.87         | 0.30         | 0.00        | 0.79         | 0.00        | 0.22         | 0.00        | 0.00         | 0.74         | 0.11        |
| 96 Somalay           | 0.34         | 0.00         | 0.00        | 0.00         | 0.00        | 0.00         | 0.00        | 0.00         | 0.00         | 0.00        |
| 97 Somalay           | 0.40         | 0.25         | 0.00        | 0.00         | 0.00        | 0.00         | 0.00        | 0.18         | 0.00         | 0.05        |
| 98 Somalay           | 1.89         | 1.67         | 0.00        | 6.13         | 0.00        | 0.59         | 0.00        | 0.32         | 0.33         | 0.00        |
| 99 Somalay           | 0.66         | 0.58         | 0.00        | 0.13         | 0.00        | 0.00         | 0.08        | 0.00         | 0.00         | 0.00        |
| 100 Somalay          | 0.32         | 0.78         | 0.00        | 0.50         | 0.00        | 0.00         | 0.00        | 0.41         | 0.00         | 0.00        |
| 101 Somalay          | 0.21         | 0.00         | 0.00        | 0.00         | 0.00        | 0.00         | 0.00        | 0.15         | 0.00         | 0.20        |
| 102 Somalay          | 0.57         | 0.80         | 0.00        | 0.15         | 0.00        | 0.00         | 0.17        | 0.09         | 0.52         | 0.00        |
| 103 Somalay          | 1.79         | 2.59         | 0.00        | 1.69         | 0.28        | 0.00         | 0.17        | 0.62         | 1.16         | 0.00        |
| 104 Somalay          | 0.15         | 0.95         | 0.00        | 1.81         | 0.00        | 0.00         | 0.00        | 0.40         | 0.34         | 0.00        |
| 105 Somalay          | 0.00         | 0.67         | 0.19        | 1.17         | 0.00        | 0.00         | 0.00        | 0.93         | 0.91         | 0.00        |
| 106 Somalay          | 1.09         | 0.16         | 0.14        | 0.51         | 0.51        | 0.00         | 0.03        | 0.30         | 0.00         | 0.00        |
| 107 Somalay          | 0.52         | 0.00         | 0.17        | 0.00         | 0.08        | 0.00         | 0.00        | 0.62         | 0.00         | 0.00        |
| 108 Somalay          | 0.29         | 0.00         | 0.00        | 0.07         | 0.00        | 0.00         | 0.08        | 0.47         | 0.00         | 0.00        |
| 109 Somalay          | 0.11         | 0.22         | 0.00        | 0.14         | 0.00        | 0.41         | 0.00        | 0.00         | 0.00         | 0.00        |
| 110 Somalay          | 0.53         | 0.56         | 0.00        | 0.36         | 0.16        | 0.00         | 0.00        | 0.00         | 0.40         | 0.00        |
| 111 Somalay          | 0.35         | 0.89         | 0.00        | 1.62         | 0.00        | 0.32         | 0.00        | 0.00         | 0.56         | 0.00        |
| 112 Somalay          | 0.16         | 0.51         | 0.00        | 0.44         | 0.00        | 0.00         | 0.00        | 0.37         | 0.00         | 0.00        |
| 113 Somalay          | 0.63         | 0.15         | 0.00        | 0.16         | 0.00        | 0.00         | 0.00        | 0.00         | 0.00         | 0.00        |
| 114 Somalay          | 1.23         | 0.43         | 0.30        | 0.87         | 0.00        | 0.00         | 0.00        | 0.52         | 0.06         | 0.00        |
| 115 Somalay          | 1.15         | 1.24         | 0.20        | 0.47         | 0.00        | 0.70         | 0.00        | 0.20         | 0.83         | 0.00        |
| 116 Somalay          | 0.23         | 0.55         | 0.00        | 0.00         | 0.00        | 0.29         | 0.00        | 0.12         | 0.00         | 0.00        |
| 117 Somalay          | 0.59         | 0.66         | 0.00        | 0.00         | 0.13        | 0.00         | 0.00        | 0.00         | 0.00         | 0.00        |
| 118 Somalay          | 1.23         | 0.77         | 0.00        | 1.21         | 0.00        | 0.23         | 0.00        | 0.24         | 0.27         | 0.00        |
| 119 Somalay          | 0.41         | 0.27         | 0.00        | 0.00         | 0.00        | 0.00         | 0.00        | 0.00         | 0.00         | 0.00        |
| 120 Somalay          | 0.00         | 0.68         | 0.00        | 0.87         | 0.00        | 1.16         | 0.00        | 0.31         | 0.00         | 0.00        |
| 121 Somalay          | 1.03         | 0.63         | 0.00        | 1.08         | 0.00        | 0.24         | 0.00        | 0.12         | 0.27         | 0.00        |
| 122 Somalay          | 0.00         | 0.42         | 0.00        | 0.19         | 0.00        | 0.00         | 0.07        | 0.25         | 0.00         | 0.00        |
| <b>Clan total</b>    | <b>28.65</b> | <b>29.91</b> | <b>4.25</b> | <b>32.84</b> | <b>1.88</b> | <b>6.14</b>  | <b>0.76</b> | <b>12.24</b> | <b>14.47</b> | <b>0.36</b> |
| <b>Village total</b> | <b>54.53</b> | <b>57.71</b> | <b>6.66</b> | <b>58.57</b> | <b>4.92</b> | <b>15.40</b> | <b>1.68</b> | <b>27.20</b> | <b>36.37</b> | <b>1.85</b> |

Source: Author's own survey 2001.

**App. 5: Seasonal Movements in Mehlp Valley**

| Villages  | From (Winter Settlements) | To (Summer Settlements) | Households  |    |
|---|---------------------------|-------------------------|-------------|----|
| <b>Mehlp</b>                                      | <b>Muzgram (27)</b>       | Pongoshal               | 6           |    |
|   | -do-                      | Chikroti                | 2           |    |
|   | -do-                      | Dranosar                | 1           |    |
|   | -do-                      | Lasht                   | 4           |    |
|   | -do-                      | Bijba                   | 1           |    |
|   | -do-                      | Shatek                  | 3           |    |
|   | -do-                      | Samchor                 | 1           |    |
|   | -do-                      | Haiz                    | 9           |    |
|   | <b>Bariyandur (37)</b>    | Chongoshal              | 3           |    |
|   | -do-                      | Chukustini              | 3           |    |
|   | -do-                      | Kochgas                 | 4           |    |
|   | -do-                      | Kholghoni               | 3           |    |
|   | -do-                      | Reesht                  | 1           |    |
|   | -do-                      | Surkhunandok            | 3           |    |
|   | -do-                      | Lashtosor               | 1           |    |
|   | -do-                      | Gashal                  | 1           |    |
|   | -do-                      | Nichagh                 | 1           |    |
|   | -do-                      | Lashtigas               | 3           |    |
|   | -do-                      | Haiz                    | 14          |    |
|   | <b>Shahchar (24)</b>      | Shadeyan khashkyer      | 12          |    |
|   | -do-                      | Lasht heiz              | 2           |    |
|   | -do-                      | Gashal                  | 2           |    |
|   | -do-                      | Adrakh                  | 3           |    |
|   | No movement               | -                       | 5           |    |
|   | <b>Bashandur (21)</b>     | Bijba                   | 8           |    |
|   | -do-                      | Chakastkup              | 9           |    |
|   | -do-                      | Bargun                  | 1           |    |
|   | -do-                      | Shatek                  | 3           |    |
|   | <b>Raghz (46)</b>         | Lasht                   | 19          |    |
|   | -do-                      | Chikroti                | 5           |    |
|   | -do-                      | Akosh                   | 3           |    |
|   | -do-                      | Chakastkup              | 6           |    |
|   | -do-                      | Samochar                | 3           |    |
|   | -do-                      | Bargun                  | 10          |    |
|   | <b>Landure (18)</b>       | Moshinodok              | 4           |    |
|   | -do-                      | Chikroti                | 1           |    |
|   | -do-                      | Shatek                  | 5           |    |
|   | -do-                      | Gashal                  | 2           |    |
|   | -do-                      | Chakastkup              | 1           |    |
|   | No movement               | -                       | 5           |    |
|   | <b>Odier</b>              | <b>Lower Odier (65)</b> | Romolasht   | 25 |
|   |                           | -do-                    | Nashtani    | 8  |
|   |                           | -do-                    | Lashtodok   | 3  |
|   |                           | -do-                    | Upper Odier | 8  |
|   |                           | No movement             | -           | 8  |
|   |                           | <b>Upper Odier (55)</b> | Romolasht   | 28 |
| -do-  |                           | Nashtani                | 17          |    |
| -do-  |                           | Upper Odier             | 4           |    |
| -do-  |                           | Lashtodok               | 1           |    |
| Odier   |                           | Shoat                   | 3           |    |
| No movement                                       |                           | -                       | 15          |    |
| <b>Shoat</b>                                      |                           | <b>Shoat (107)</b>      | Mehlp       | 8  |
|   | -do-                      | Adrakh                  | 79          |    |
|   | No movement               | -                       | 20          |    |
|   | <b>Total</b>              |                         | <b>400</b>  |    |
| Households participating in the seasonal movement |                           |                         | 347 (87%)   |    |

Sources: own survey 2001 and personal communication with ABDUL BARI, Peshawar (2002).

**App. 6 List of Villages in Torkhow Tahsil (1961)**

| Name of the Village | Population   |
|---------------------|--------------|
| Auir                | 317          |
| Boop                | 73           |
| Dankshor            | 86           |
| Hanjeeel            | 522          |
| Kaboot              | 129          |
| Kahat               | 1828         |
| Khot                | 672          |
| Malap               | 773          |
| Reech               | 1349         |
| Rayin               | 606          |
| Ragh-biar           | 354          |
| Rayas               | 720          |
| Santhar             | 400          |
| Sher-Shal           | 157          |
| Sukht               | 159          |
| Shuth               | 63           |
| Shagram             | 607          |
| Sherjvil            | 144          |
| Tahzir              | 199          |
| Washinch            | 851          |
| Warkus              | 138          |
| Warkop              | 686          |
| Zanglasht           | 548          |
| Istaru              | 428          |
| <b>Total</b>        | <b>11809</b> |

Source: Census report of tribal areas 1961

**App. 7 List of Villages in Torkhow Tahsil (1972)**

| Name of the Village  | Population   | Author's Comments   |
|--|--------------|---|
| Barhyandeh (Malp), Budnadoor (Shout), Daghar (Shout), Dukan (Shout), Ghorda (Malp), Khoshandeh (Shout), Lashti Gaz (Malp), Matiyandoor (Malp), Matu Pandehi (South), Muzhgram (Malp), Panjiantak (Shout), Rakit (Malp), Ruwach (Malp), Shahchar (Malp), Shalmu Chatur (Shout), Shawarch (Malp), Sirkhot (Malp), Somolasht (Shout)                  | 783          | Mehlp valley:<br>Neighbourhoods of Shot and part of Mehlp |
| Dukan, Bulasht, Khoshandoori, Mulrech, Nanlasht, Nisir, Ruwah, Sorech  | 1520         | Rech Valley and neighbourhoods                            |
| Mayar, Arhotwaht, Buzund, Chirik Lasht, Waisch Proper  | 1245         | Buzund and Washich Neighbourhoods                         |
| Muzhodoor (Rayen), Bardan (Rayen), Hone (Rayen), Janali Pangi (Rayen), Junalisoor (Rayen), Kholbort (Rayen), Khoshandeh (Werkop), Lohogaz (Rayen), Lolandoor (Werkop), Lotdoor (Rayen), Mulyom (Rayen), Muzdeh (Werkop) Muzhodoor (Rayen), Pongdoor (Rayen), Shorang (Rayen), Warzodeh (Werkop), Warzodoor (Rayen), Zindrozi (Werkop)              | 1150         | Neighbourhoods of Rayeen and Werkop                       |
| Naghdooor, Budulook, Dok, Mayar, Ochwakht, Shahandoor, Shotkhar, Shoukatandoor   | 1127         | Shotkhar and part of Khot                                 |
| Noghparchi, Amadu Tat, Arhowakht, Baisolasht, Dargharandur, Lashtdur, Moshandurah, Munkat, Puchung, Pumbarash, Qazandur, Rabat, Yakhdees,  | 1332         | Parts of Lower Khot valley                                |
| Partch, Amunet, Ujnu, Zhang Lasht  | 1558         | Unju and Zang Lasht                                       |
| Shabazandeh (Werkop), Gola Muli (Werkop), Goldoor (Istaru), Lashti (Istaru), Neyuk (Werkop), Nodragh (Istaru), Qarehandeh (Werkop)   | 1083         | Neighbourhoods of Istaru and Werkop                       |
| Sheikh Rawandoor, Anguk, Dudandoor, Hone, Khachumart, Kishik, Konar, Marandeh, Torkhoh   | 1156         | Khot Bala   |
| Sherjuli, Badandoor, Baramushandoor, Bawarhyandoor, Begalandoor, Buwin, Charantek, Dashmandoor, Dok, Gapa, Ghotandoor, Goldoor, Golgaz, Gudandoor, Khakboomi, Lasht, Manakandoor, Moghodoor, Noghor, Oshyandoor, Rhghandoor, Rowandoor, Soranlasht, Tajjandeh, Tor-Noghor, Zuhrandoor  | 1130         | Shagram   |
| Taughtori  | 1144         | Upper Khot Valley   |
| Zhukyandoor (Rayen), Bandusandoor (Rayen), Bashandeh (Malp), Chawelandoor (Rayen), Kashalandoor (Rayen), Landoor (Malp), Majalashst (Rayen), Mukhtalyandeh (Rayen), Muldeh (Rayen), Mutyandoor (Malp), Nichagh (Malp), Odeer (Malp), Raghz (Malp), Shadyandoor (Malp), Shouqiandoor (Rayen), Tordeh (Rayen), Weshkudoori (Rayen), Zoghantek (Malp) | 1194         | Neighbourhoods of Rayeen and Mehlp                        |
| <b>Total</b>   | <b>14422</b> |   |

Source: District census report of Chitral 1976.

**App. 8 Name and Clan Composition of Neighbourhoods in Winter Settlement**

| <b>Name of the Village</b>   | <b>Population</b> | <b>Author's Comments</b>                                  |
|--|-------------------|---|
| Barhyandeh (Malp), Budnadoor (Shout), Daghar (Shout), Dukan (Shout), Ghorda (Malp), Khoshandeh (Shout), Lashti Gaz (Malp), Matiyandoor (Malp), Matu Pandehi (South), Muzhgram (Malp), Panjiantak (Shout), Rakit (Malp), Ruwach (Malp), Shahchar (Malp), Shalmu Chatur (Shout), Shawarch (Malp), Sirkhot (Malp), Somolasht (Shout)                | 783               | Mehlp valley:<br>Neighbourhoods of Shot and part of Mehlp |
| Dukan, Bulasht, Khoshandoori, Mulrech, Nanlasht, Nisir, Ruwah, Sorech  | 1520              | Rech Valley and neighbourhoods                            |
| Mayar, Arhotwaht, Buzund, Chirik Lasht, Waisch Proper  | 1245              | Buzund and Washich Neighbourhoods                         |
| Muzhodoor (Rayen), Bardan (Rayen), Hone (Rayen), Janali Pangi (Rayen), Junalisoor (Rayen), Kholbort (Rayen), Khoshandeh (Werkop), Lohogaz (Rayen), Lolandoor (Werkop), Lotdoor (Rayen), Mulyom (Rayen), Muzdeh (Werkop) Muzhodoor (Rayen), Pongdoor (Rayen), Shorang (Rayen), Warzodeh (Werkop), Warzodoor (Rayen), Zindrozi (Werkop)            | 1150              | Neighbourhoods of Rayeen and Werkop                       |
| Naghdooor, Budulook, Dok, Mayar, Ochwakht, Shahandoor, Shotkhar, Shoukatandoor   | 1127              | Shotkhar and part of Khot                                 |
| Noghparchi, Amadu Tat, Arhowakht, Baisolasht, Dargharandur, Lashtdur, Moshandurah, Munkat, Puchung, Pumarash, Qazandur, Rabat, Yakhdees,   | 1332              | Parts of Lower Khot valley                                |
| Partch, Amunet, Ujnu, Zhang Lasht  | 1558              | Unju and Zang Lasht                                       |
| Shabazandeh (Werkop), Gola Muli (Werkop), Goldoor (Istaru), Lashti (Istaru), Neyuk (Werkop), Nodragh (Istaru), Qarehandeh (Werkop)   | 1083              | Neighbourhoods of Istaru and Werkop                       |
| Sheikh Rawandoor, Anguk, Dudandoor, Hone, Khachumart, Kishik, Konar, Marandeh, Torkhoh   | 1156              | Khot Bala   |
| Sherjuli, Badandoor, Baramushandoor, Bawarhyandoor, Begalandoor, Buwin, Charantek, Dashmandoor, Dok, Gapa, Ghotandoor, Goldoor, Golgaz, Gudandoor, Khakboomi, Lasht, Manakandoor, Moghodoor, Noghor, Oshyandoor, Rhghandoor, Rowandoor, Soranlasht, Tajjandeh, Tor-Noghor, Zuhrandoor  | 1130              | Shagram   |
| Taughtori  | 1144              | Upper Khot Valley   |
| Zhukyandoor (Rayen), Bandusandoor (Rayen), Bashandeh (Malp), Chawelandoor (Rayen), Kashalandoor (Rayen), Landoor (Malp), Majalasht (Rayen), Mukhtalyandeh (Rayen), Muldeh (Rayen), Mutyandoor (Malp), Nichagh (Malp), Odeer (Malp), Raghz (Malp), Shadyandoor (Malp), Shouqandoor (Rayen), Tordeh (Rayen), Weshkudoori (Rayen), Zoghantek (Malp) | 1194              | Neighbourhoods of Rayeen and Mehlp                        |
| <b>Total</b>   | <b>14422</b>      |   |

Source: District census report of Chitral 1976.

**App. 9 Name and Clan Composition of Neighbourhoods in Summer Settlement**

| Name of the neighbourhood | Number of houses | Clan composition                         |
|---------------------------|------------------|--|
| Khainoghor (Romolasht)    | 16               | 9 Bulay and 7 Somalay                    |
| Pastokorini -do-          | 6                | 5 Shaipay one Somalay                    |
| Nerun -do-                | 8                | Somalay                                  |
| Shapiro Khoto -do-        | 2                | -do-                                     |
| Kham -do-                 | 5                | -do-                                     |
| Mul Lasht -do-            | 8                | 1 each Shaipay, Somalay and others Bulay |
| Patik Dini -do-           | 4                | Somalay                                  |
| Khanar Khol -do-          | 3                | -do-                                     |
| Desho Tek -do-            | 1                | Nasketek                                 |
| Chat (Nashtani)           | 1                | Somalay                                  |
| Nispizang -do-            | 2                | -do-                                     |
| Muzoshal -do-             | 4                | -do-                                     |
| Nashtani -do-             | 7                | -do-                                     |
| Lashto Dok -do-           | 6                | 3 Bulay & 3 Nasketek                     |
| Chato Sor -do-            | 4                | 2 Nasketek & one each Bulay and Shaipay  |

Source: Author's own survey 2001.

**App. 10 Distribution of Clans in Mehlp Valley Including Ghorda**

| Name of clans | Distribution in Mehlp Valley (Households) |            |           |            |            | Households 1990 <sup>1</sup> |
|---------------|---|------------|-----------|------------|------------|------------------------------|
|               | Odier                                     | Shoat      | Ghorda    | Mehlp      | Total      |                              |
| Bachay        | -   | -          | 4         | 20         | 24         | 14                           |
| Bulay         | 31  | -          | -         | -          | 31         | 15                           |
| Dashmanay     | -   | -          | 2         | -          | 2          | -                            |
| Jundusay      | -   | -          | -         | 5          | 5          | 7                            |
| Khushay       | 3   | -          | 3         | -          | 22         | 13                           |
| Lasakay       | -   | 4          | -         | -          | 4          | 3                            |
| Makhdalay     | -   | 15         | -         | 4          | 19         | 13                           |
| Matumay       | -   | 32         | 17        | 6          | 55         | 18                           |
| Mutheay       | -   | 22         | -         | -          | 22         | 11                           |
| Nasketek      | 10  | -          | -         | 25         | 35         | 24                           |
| Pineenshoway  | -   | -          | -         | 50         | 50         | 30                           |
| Raghzek       | -   | -          | -         | 39         | 39         | 24                           |
| Shadeyay      | 6   | 9          | -         | 14         | 29         | 20                           |
| Shaipay       | 15  | -          | -         | -          | 15         | 11                           |
| Sangalay      | -   | -          | -         | 10         | 10         | 6                            |
| Somalay       | 55  | -          | -         | -          | 55         | 20                           |
| Zondray       | -   | 9          | 1         | -          | 10         | 5                            |
| <b>Total</b>  | <b>120</b>                                | <b>107</b> | <b>27</b> | <b>173</b> | <b>427</b> | <b>234</b>                   |

Source: Author's own survey 2001.

<sup>1</sup> After EGGERT 1990, 181.

**App. 11 Social Status in the Individual Villages of Torkhow Tahsil**

| Villages        | Adam-zada  | Area*            | Spiri-tual | Area*         | Yuft       | Area*           | Bol-doyu   | Area*           | Shir-moosh | Area*         | Rayal     | Area*          | Hand worker | Area*         |
|-----------------|------------|------------------|------------|---------------|------------|-----------------|------------|-----------------|------------|---------------|-----------|----------------|-------------|---------------|
| Istaru          | 14         | 94+26            | 4          | 8             | 21         | 150+20          | 3          | 8+4             | 17         | 120+70        | 33        | 320+48         | -           | -             |
| Werkup          | 40         | 206+80<br>(100)  | 10         | 16+9          | 25         | 44+23           | 41         | 62+31           | 18         | 32            | 10        | 20+15          | 8           | 10+15         |
| Rain            | 86         | 939+142          | 6          | 68            | 23         | 105+42          | -          | -               | 13         | 84            | -         | -              | -           | -             |
| Melph           | 19         | 70+52<br>(30)    | -          | -             | 126        | 400+280         | 58         | 214+145         | -          | -             | 26        | 355            | 5           | 10            |
| Shagram         | 81         | 2266+88<br>(140) | 21         | 135+5         | 51         | 253+28          | 21         | 89+7            | 12         | 12            | -         | -              | 6           | 40            |
| Sholkhar        | 1          | 8 (50)           | 11         | 63            | 41         | 330+8           | 53         | 245             | 1          | 6             | -         | -              | 5           | 25            |
| Kout            | 273        | 813 (250)        | 18         | 28            | 92         | 195             | 83         | 457             | 51         | 187           | 21        | 315            | 12          | 39            |
| Washich         | 122        | 745+49           | -          | -             | 22         | 92              | 3          | 4               | 11         | 57            | -         | -              | -           | -             |
| Buzunt          | 21         | 115              | -          | -             | 2          | 6               | -          | -               | -          | -             | -         | -              | -           | -             |
| Zanglasht       | 28         | 290+105          | -          | -             | 13         | 97+30           | 2          | 70              | 3          | 45+8          | -         | -              | -           | -             |
| Uzhnu           | 76         | 757 (100)        | -          | -             | 36         | 215             | 27         | 190             | 8          | 20            | -         | -              | -           | -             |
| Parech          | 5          | 80               | 4          | 35            | -          | -               | 37         | 380             | 5          | 10            | -         | -              | -           | -             |
| Nisau           | -          | -                | 17         | 100           | -          | -               | -          | -               | 5          | 25            | -         | -              | -           | -             |
| Moorech         | 4          | 100              | 28         | 100           | -          | -               | 7          | 20              | 4          | 8             | -         | -              | -           | -             |
| Ragh & Nialasht | -          | -                | 24         | 60+6          | -          | -               | 7          | 18              | -          | -             | -         | -              | -           | -             |
| Sorrech         | 13         | 50+10            | 16         | 38+18         | 1          | 8               | 31         | 44+41           | -          | -             | -         | -              | -           | -             |
| Salandur        | 2          | 30               | 28         | 100           | 1          | 10              | 8          | 20              | -          | -             | -         | -              | -           | -             |
| Bulashit        | -          | -                | 11         | 15            | -          | -               | 32         | 81+8            | -          | -             | -         | -              | 1           | 3             |
| <b>Total</b>    | <b>785</b> | <b>7233+552</b>  | <b>198</b> | <b>786+48</b> | <b>454</b> | <b>1805+429</b> | <b>413</b> | <b>1900+236</b> | <b>148</b> | <b>606+78</b> | <b>90</b> | <b>1010+63</b> | <b>37</b>   | <b>127+15</b> |

Source: Eggert, 1890: 197 (statistik Nr. IV table format modified).

\* Figures of the arable land in the area columns represent area owned by the households in winter and summer settlements respectively.  
(Figures in the parentheses show arable land owned by the absentee landlord)

## BONNER GEOGRAPHISCHE ABHANDLUNGEN

- Heft 4: *Hahn, H.*: Der Einfluß der Konfessionen auf die Bevölkerungs- und Sozialgeographie des Hunsrückes. 1950. 96 S. € 2,50
- Heft 5: *Timmermann, L.*: Das Eupener Land und seine Grünlandwirtschaft. 1951. 92 S. € 3,-
- Heft 15: *Pardé, M.*: Beziehungen zwischen Niederschlag und Abfluß bei großen Sommerhochwassern. 1954. 59 S. € 2,-
- Heft 16: *Braun, G.*: Die Bedeutung des Verkehrswesens für die politische und wirtschaftliche Einheit Kanadas. 1955. 96 S. € 4,-
- Heft 19: *Steinmetzler, J.*: Die Anthropogeographie Friedrich Ratzels und ihre ideengeschichtlichen Wurzeln. 1956. 151 S. € 4,-
- Heft 21: *Zimmermann, J.*: Studien zur Anthropogeographie Amazoniens. 1958. 97 S. € 5,-
- Heft 22: *Hahn, H.*: Die Erholungsgebiete der Bundesrepublik. Erläuterungen zu einer Karte der Fremdenverkehrsorte in der deutschen Bundesrepublik. 1958. 182 S. € 5,50
- Heft 23: *von Bauer, P.-P.*: Waldbau in Südchile. Standortkundliche Untersuchungen und Erfahrungen bei der Durchführung einer Aufforstung. 1958. 120 S. € 5,50
- Heft 26: *Fränzle, O.*: Glaziale und periglaziale Formbildung im östlichen Kastilischen Scheidegebirge (Zentralspanien). 1959. 80 S. € 5,-
- Heft 27: *Bartz, F.*: Fischer auf Ceylon. 1959. 107 S. € 5,-
- Heft 30: *Leidlmair, A.*: Hadramaut, Bevölkerung und Wirtschaft im Wandel der Gegenwart. 1961. 47 S. € 4,-
- Heft 33: *Zimmermann, J.*: Die Indianer am Cururú (Südwestpará). Ein Beitrag zur Anthropogeographie Amazoniens. 1963. 111 S. € 10,-
- Heft 37: *Em, H.*: Die dreidimensionale Anordnung der Gebirgsvegetation auf der Iberischen Halbinsel. 1966. 132 S. € 10,-
- Heft 38: *Hansen, F.*: Die Hanfwirtschaft Südostspaniens. Anbau, Aufbereitung und Verarbeitung des Hanfes in ihrer Bedeutung für die Sozialstruktur der Vegas. 1967. 155 S. € 11,-
- Heft 39: *Sermet, J.*: Toulouse et Zaragoza. Comparaison des deux villes. 1969. 75 S. € 8,-
- Heft 41: *Monheim, R.*: Die Agrostadt im Siedlungsgefüge Mittelsiziens. Erläutert am Beispiel Gangi. 1969. 196 S. € 10,50
- Heft 42: *Heine, K.*: Fluß- und Talgeschichte im Raum Marburg. Eine geomorphologische Studie. 1970. 195 S. € 10,-
- Heft 43: *Eriksen, W.*: Kolonisation und Tourismus in Ostpatagonien. Ein Beitrag zum Problem kulturgeographischer Entwicklungsprozesse am Rande der Ökumene. 1970. 289 S. € 14,50
- Heft 44: *Rother, K.*: Die Kulturlandschaft der tarentinischen Golfküste. Wandlungen unter dem Einfluß der italienischen Agrarreform. 1971. 246 S. € 14,-
- Heft 45: *Bahr, W.*: Die Marismas des Guadalquivir und das Ebrodelta. 1972. 282 S. € 13,-
- Heft 47: *Golte, W.*: Das südchilenische Seengebiet. Besiedlung und wirtschaftliche Erschließung seit dem 18. Jahrhundert. 1973. 183 S. € 14,-
- Heft 48: *Stephan, J.*: Die Landschaftsentwicklung des Stadtkreises Karlsruhe und seiner näheren Umgebung. 1974. 190 S. € 20,-
- Heft 49: *Thiele, A.*: Luftverunreinigung und Stadtklima im Großraum München. 1974. 175 S. € 19,50
- Heft 50: *Bähr, J.*: Migration im Großen Norden Chiles. 1977. 286 S. € 15,-
- Heft 51: *Stütz, V.*: Studien zur Kulturgeographie Zentraläthiopiens. 1974. 395 S. € 14,50
- Heft 53: *Klaus, D.*: Niederschlagsgenese und Niederschlagsverteilung im Hochbecken von Puebla-Tlaxcala. 1975. 172 S. € 16,-
- Heft 54: *Banco, I.*: Studien zur Verteilung und Entwicklung der Bevölkerung von Griechenland. 1976. 297 S. € 19,-
- Heft 55: *Selke, W.*: Die Ausländerwanderung als Problem der Raumordnungspolitik in der Bundesrepublik Deutschland. 1977. 167 S. € 14,-
- Heft 56: *Sander, H.-J.*: Sozialökonomische Klassifikation der Kleinbäuerlichen Bevölkerung im Gebiet von Puebla-Tlaxcala (Mexiko). 1977. 169 S. € 12,-
- Heft 57: *Wiek, K.*: Die städtischen Erholungsflächen. Eine Untersuchung ihrer gesellschaftlichen Bewertung und ihrer geographischen Standorteigenschaften - dargestellt an Beispielen aus Westeuropa und den USA. 1977. 216 S. € 10,-
- Heft 58: *Frankenberg, P.*: Floreogeographische Untersuchungen im Raume der Sahara. Ein Beitrag zur pflanzengeographischen Differenzierung des nordafrikanischen Trockenraumes. 1978. 136 S. € 24,-
- Heft 60: *Liebold, E.*: Zentralörtlich-funktionalräumliche Strukturen im Siedlungsgefüge der Nordmeseta in Spanien. 1979. 202 S. € 14,50
- Heft 61: *Leusmann, Ch.*: Strukturierung eines Verkehrsnetzes. Verkehrsgeographische Untersuchungen unter Verwendung graphentheoretischer Ansätze am Beispiel des süddeutschen Eisenbahnnetzes. 1979. 158 S. € 16,-
- Heft 62: *Seibert, P.*: Die Vegetationskarte des Gebietes von El Bolsón, Provinz Río Negro, und ihre Anwendung in der Landnutzungsplanung. 1979. 96 S. € 14,50
- Heft 63: *Richter, M.*: Geoökologische Untersuchungen in einem Tessiner Hochgebirgstal. Dargestellt am Val Vegomess im Hinblick auf planerische Maßnahmen. 1979. 209 S. € 16,50
- Heft 67: *Hölleremann, P.*: Blockgletscher als Mesoformen der Periglazialstufe - Studien aus europäischen und nordamerikanischen Hochgebirgen. 1983. 84 S. € 13,-
- Heft 69: *Graafen, R.*: Die rechtlichen Grundlagen der Ressourcenpolitik in der Bundesrepublik Deutschland. Ein Beitrag zur Rechtsgeographie. 1984. 201 S. € 14,-
- Heft 70: *Freiberg, H.-M.*: Vegetationskundliche Untersuchungen an südchilenischen Vulkanen. 1985. 170 S. € 16,50



## BONNER GEOGRAPHISCHE ABHANDLUNGEN (Fortsetzung · continued)

- Heft 71: *Yang, T.*: Die landwirtschaftliche Bodennutzung Taiwans. 1985. 178 S. € 13,--
- Heft 72: *Gaskin-Reyes, C.E.*: Der informelle Wirtschaftssektor in seiner Bedeutung für die neuere Entwicklung in der nordperuanischen Regionalstadt Trujillo und ihrem Hinterland. 1986. 214 S. € 14,50
- Heft 73: *Brückner, Ch.*: Untersuchungen zur Bodenerosion auf der Kanarischen Insel Hierro. 1987. 194 S. € 16,--
- Heft 74: *Frankenberg, P. u. D. Klaus*: Studien zur Vegetationsdynamik Südosttunesiens. 1987. 110 S. € 14,50
- Heft 75: *Siegburg, W.*: Großmaßstäbige Hangneigungs- und Hangformanalyse mittels statistischer Verfahren Dargestellt am Beispiel der Dollendorfer Hardt (Siebengebirge). 1987. 243 S. € 19,--
- Heft 77: *Anhuf, D.*: Klima und Ernteertrag - eine statistische Analyse an ausgewählten Beispielen nord- und südsaharischer Trockenräume - Senegal, Sudan, Tunesien. 1989. 177 S. € 18,--
- Heft 78: *Rheker, J.R.*: Zur regionalen Entwicklung der Nahrungsmittelproduktion in Pernambuco (Nordbrasilien). 1989. 177 S. € 17,50
- Heft 79: *Völkel, J.*: Geomorphologische und pedologische Untersuchungen zum jungquartären Klimawandel in den Dünengebieten Ost-Nigers (Südsahara und Sahel). 1989. 258 S. € 19,50
- Heft 80: *Bromberger, Ch.*: Habitat, Architecture and Rural Society in the Gilân Plain (Northern Iran). 1989. 104 S. € 15,--
- Heft 81: *Krause, R.F.*: Stadtgeographische Untersuchungen in der Altstadt von Djidda / Saudi-Arabien. 1991. 76 S. € 14,--
- Heft 82: *Graafen, R.*: Die räumlichen Auswirkungen der Rechtsvorschriften zum Siedlungswesen im Deutschen Reich unter besonderer Berücksichtigung von Preußen, in der Zeit der Weimarer Republik. 1991. 283 S. € 32,--
- Heft 83: *Pfeiffer, L.*: Schwermineralanalysen an Dünen sanden aus Trockengebieten mit Beispielen aus Südsahara, Sahel und Sudan sowie der Namib und der Taklamakan. 1991. 235 S. € 21,--
- Heft 84: *Dittmann, A. and H.D. Laux (Hrsg.)*: German Geographical Research on North America - A Bibliography with Comments and Annotations. 1992. 398 S. € 24,50
- Heft 85: *Grunert, J. u. P. Höllermann, (Hrsg.)*: Geomorphologie und Landschaftsökologie. 1992. 224 S. € 14,50
- Heft 86: *Bachmann, M. u. J. Bendix*: Nebel im Alpenraum. Eine Untersuchung mit Hilfe digitaler Wettersatellitendaten. 1993. 301 S. € 29,--
- Heft 87: *Schickhoff, U.*: Das Kaghan-Tal im Westhimalaya (Pakistan). 1993. 268 S. € 27,--
- Heft 88: *Schulte, R.*: Substitut oder Komplement - die Wirkungsbeziehungen zwischen der Telekommunikationstechnik Video-Konferenz und dem Luftverkehrsaufkommen deutscher Unternehmen. 1993. 177 S. € 16,--
- Heft 89: *Lützel, R.*: Räumliche Unterschiede der Sterblichkeit in Japan - Sterblichkeit als Indikator regionaler Lebensbedingungen. 1994. 247 S. € 21,--
- Heft 90: *Grafe, R.*: Ländliche Entwicklung in Ägypten. Strukturen, Probleme und Perspektiven einer agraren Gesellschaft, dargestellt am Beispiel von drei Dörfern im Fayyûm. 1994. 225 S. € 23,--
- Heft 92: *Weiers, S.*: Zur Klimatologie des NW-Karakorum und angrenzender Gebiete. Statistische Analysen unter Einbeziehung von Wettersatellitenbildern und eines Geographischer Informationssystems (GIS). 1995. 216 S. € 19,--
- Heft 93: *Braun, G.*: Vegetationsgeographische Untersuchungen im NW-Karakorum (Pakistan). 1996. 156 S. € 27,--
- Heft 94: *Braun, B.*: Neue Cities australischer Metropolen. Die Entstehung multifunktionaler Vorortzentren als Folge der Suburbanisierung. 1996. 316 S. € 14,50
- Heft 95: *Krafft, Th. u. L. Garcia-Castrillo Riesco (Hrsg.)*: Professionalisierung oder Ökonomisierung im Gesundheitswesen? Rettungsdienst im Umbruch. 1996. 220 S. € 12,--
- Heft 96: *Kemper, F.-J.*: Wandel und Beharrung von regionalen Haushalts- und Familienstrukturen. Entwicklungsmuster in Deutschland im Zeitraum 1871-1978. 1997. 306 S. € 17,--
- Heft 97: *Nüsser, M.*: Nanga Parbat (NW-Himalaya): Naturräumliche Ressourcenausstattung und humanökologische Gefügemuster der Landnutzung. 1998. 232 S. € 21,--
- Heft 98: *Bendix, J.*: Ein neuer Methodenverbund zur Erfassung der klimatologisch-lufthygienischen Situation von Nordrhein-Westfalen. Untersuchungen mit Hilfe boden- und satellitengestützter Fernerkundung und numerischer Modellierung. 1998. 183 S. € 24,--
- Heft 99: *Dehn, M.*: Szenarien der klimatischen Auslösung alpiner Hangrutschungen. Simulation durch Downscaling allgemeiner Zirkulationsmodelle der Atmosphäre. 1999. 99 S. € 11,--
- Heft 100: *Krafft, Th.*: Von Shâhjahânâbâd zu Old Delhi: Zur Persistenz islamischer Strukturelemente in der nordindischen Stadt. 1999. 217 S. € 19,50
- Heft 101: *Schröder, R.*: Modellierung von Verschlammung und Infiltration in landwirtschaftlich genutzten Einzugsgebieten. 2000. 175 S. € 12,--
- Heft 102: *Kraas, F. und W. Taubmann (Hrsg.)*: German Geographical Research on East and Southeast Asia. 2000. 154 S. € 16,--
- Heft 103: *Esper, J.*: Paläoklimatische Untersuchungen an Jahringen im Karakorum und Tien Shan Gebirge (Zentralasien). 2000. 137 S. € 11,--
- Heft 104: *Halves, J.-P.*: Call-Center in Deutschland. Räumliche Analyse einer standortunabhängigen Dienstleistung. 2001. 148 S. € 13,--
- Heft 105: *Stöber, G.*: Zur Transformation bäuerlicher Hauswirtschaft in Yasin (Northern Areas, Pakistan). 2001. 314 S. € 18,--

## BONNER GEOGRAPHISCHE ABHANDLUNGEN (Fortsetzung · *continued*)

- Heft 106: *Clemens, J.*: Ländliche Energieversorgung in Astor: Aspekte des nachhaltigen Ressourcenmanagements im nord-pakistanischen Hochgebirge. 2001. 210 S. € 19,-
- Heft 107: *Motzkus, A. H.*: Dezentrale Konzentration - Leitbild für eine Region der kurzen Wege? Auf der Suche nach einer verkehrssparsamen Siedlungsstruktur als Beitrag für eine nachhaltige Gestaltung des Mobilitätsgeschehens in der Metropolregion Rhein-Main. 2002. 182 S. € 18,-
- Heft 108: *Braun, Th.*: Analyse, Planung und Steuerung im Gesundheitswesen. Geographische Möglichkeiten und Perspektiven am Beispiel von Daten der Gesetzlichen Krankenversicherung. 2002. 147 S. € 16,-
- Heft 109: *Reudenbach, Chr.*: Konvektive Sommerniederschläge in Mitteleuropa. Eine Kombination aus Satellitenfernerkundung und numerischer Modellierung zur automatischen Erfassung mesoskaliger Niederschlagsfelder. 2003. 152 S. € 18,-
- Heft 110: *Hörsch, B.*: Zusammenhang zwischen Vegetation und Relief in alpinen Einzugsgebieten des Wallis (Schweiz). Ein multiskaliger GIS- und Fernerkundungsansatz. 2003. 270 S. € 24,-
- Heft 111: *Rasemann, S.*: Geomorphometrische Struktur eines mesoskaligen alpinen Geosystems. 2004. 240 S. € 22,-
- Heft 112: *Schmidt, M.*: Boden- und Wasserrecht in Shigar, Baltistan: Autochthone Institutionen der Ressourcennutzung im Zentralen Karakorum. 2004. 314 S. € 25,-
- Heft 113: *Schüttemeyer, A.*: Verdichtete Siedlungsstrukturen in Sydney. Lösungsansätze für eine nachhaltige Stadtentwicklung. 2005. 159 S. € 19,-
- Heft 114: *Grugel, A.*: Zuni Pueblo und Laguna Pueblo - Ökonomische Entwicklung und kulturelle Perspektiven. 2005. 281 S. € 21,-
- Heft 115: *Schmidt, U.*: Modellierung des kurzweiligen solaren Strahlungshaushalts im Hochgebirge auf der Basis von digitalen Geländemodellen und Satellitendaten am Beispiel des Hunza-Karakorum / Nordpakistan. 2006. 133 S. € 21,-
- Heft 116: *Nyenhuis, M.*: Permafrost und Sedimenthaushalt in einem alpinen Geosystem. 2006. 142 S. € 23,-

In Kommission bei · *on consignment by* Asgard-Verlag, Sankt Augustin

Nicht genannte Nummern sind vergriffen, sämtliche Titel unter  
*Titles not listed are out of print, see for all titles*

[www.giub.uni-bonn.de/schriften/welcome.html](http://www.giub.uni-bonn.de/schriften/welcome.html)

1. The first step in the process of identifying and classifying information is to determine whether the information is sensitive. This is done by asking the following questions:

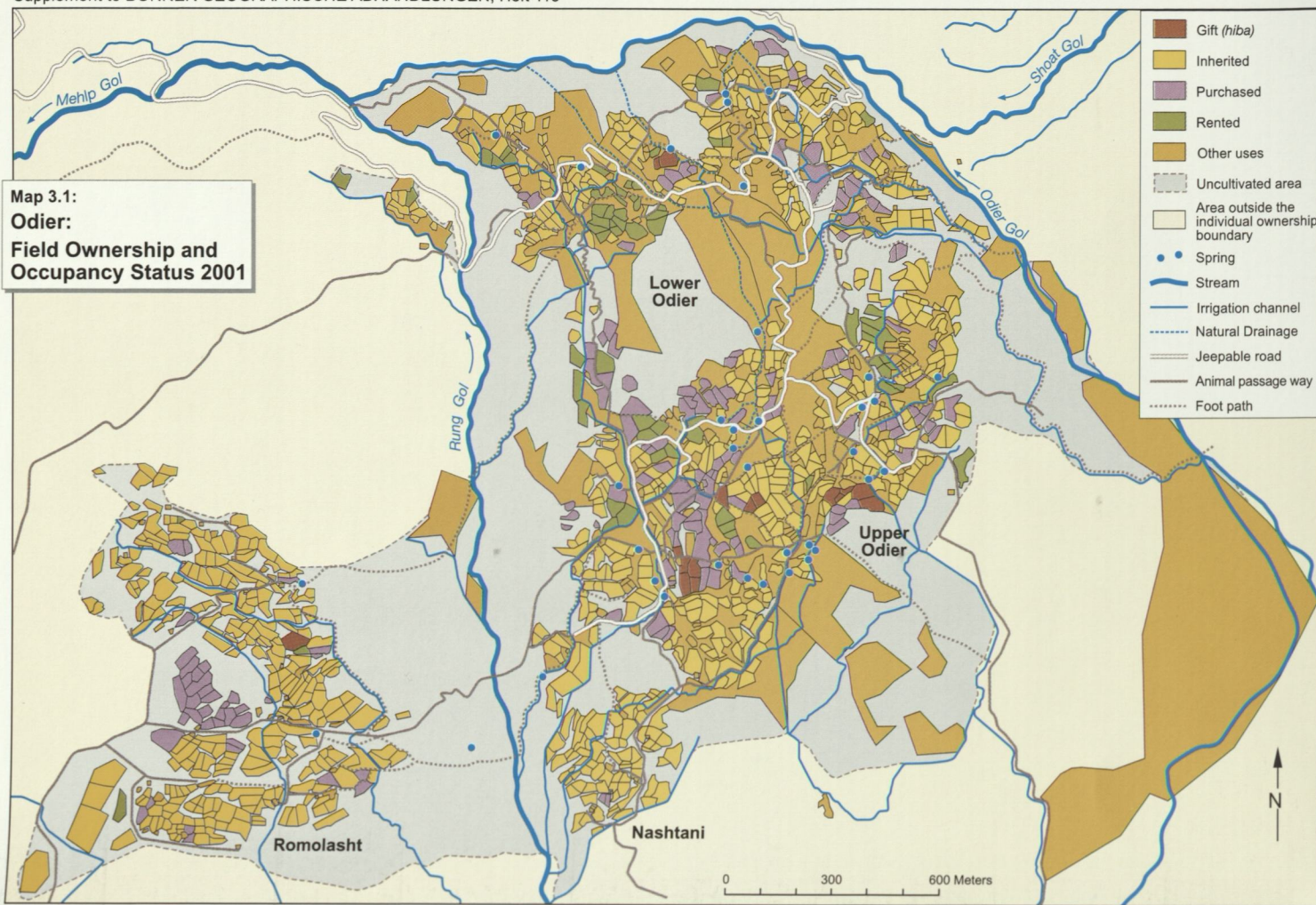
- Does the information relate to the national defense, foreign relations, or the internal security of the United States?
- Does the information, if disclosed, reasonably could be expected to result in the identification of sources, methods, or activities of the intelligence community?
- Does the information, if disclosed, reasonably could be expected to result in the identification of individuals who are providing information to the intelligence community?
- Does the information, if disclosed, reasonably could be expected to result in the identification of individuals who are providing information to the intelligence community?
- Does the information, if disclosed, reasonably could be expected to result in the identification of individuals who are providing information to the intelligence community?

2. If the answer to any of these questions is "yes," the information is sensitive and should be classified. The next step is to determine the appropriate classification level. This is done by asking the following questions:

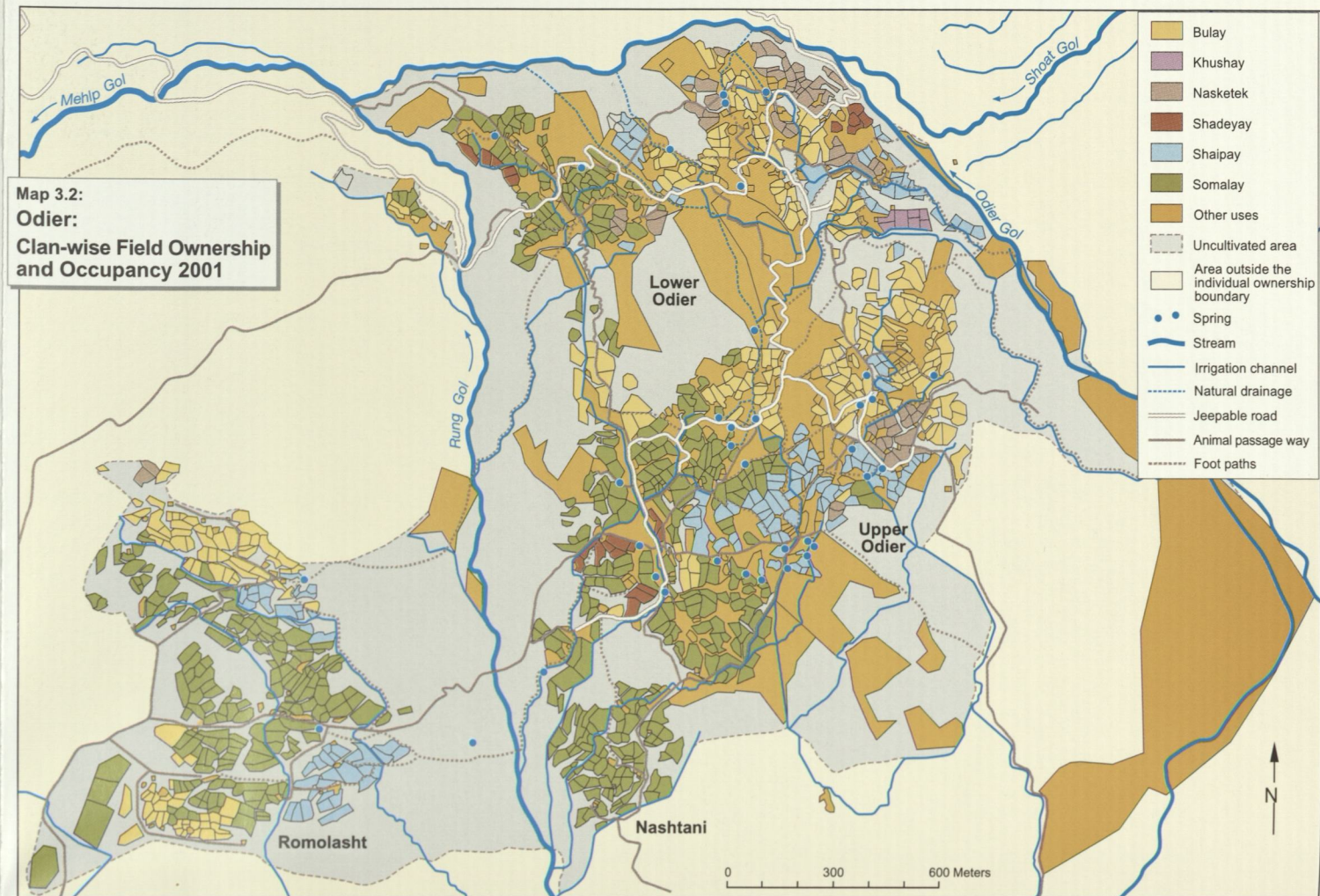
- Does the information relate to the national defense, foreign relations, or the internal security of the United States?
- Does the information, if disclosed, reasonably could be expected to result in the identification of sources, methods, or activities of the intelligence community?
- Does the information, if disclosed, reasonably could be expected to result in the identification of individuals who are providing information to the intelligence community?
- Does the information, if disclosed, reasonably could be expected to result in the identification of individuals who are providing information to the intelligence community?
- Does the information, if disclosed, reasonably could be expected to result in the identification of individuals who are providing information to the intelligence community?

3. If the answer to any of these questions is "yes," the information should be classified at the appropriate level. If the answer to all of these questions is "no," the information is not sensitive and should not be classified.

**Map 3.1:  
Odier:  
Field Ownership and  
Occupancy Status 2001**

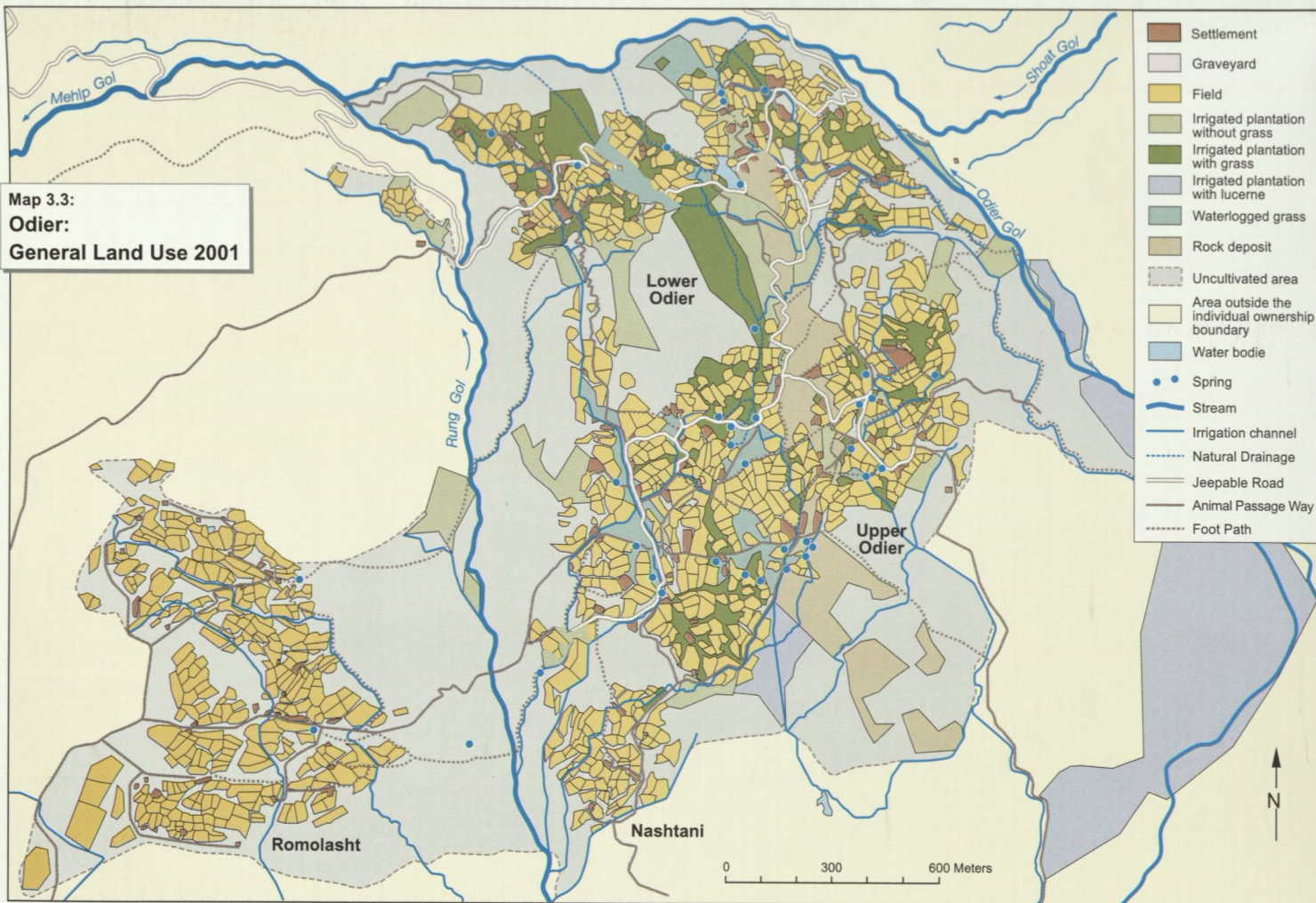


**Map 3.2:  
Odier:  
Clan-wise Field Ownership  
and Occupancy 2001**



Sources: Geometrically Rectified IKONOS Image (28.04.2001); Autor's Own Survey 2001 - Draft: Fazlur-Rahman (2003) - Cartography: H. Kieslinger

**Map 3.3:  
Odier:  
General Land Use 2001**



**Map 3.4:  
Odier:  
Cropping Pattern 2001**

